October 1954

RAILWAY TRACK and STRUCTURES

One of Five Specialized Railway Age Publications

FALL CONVENTIONS NUMBER

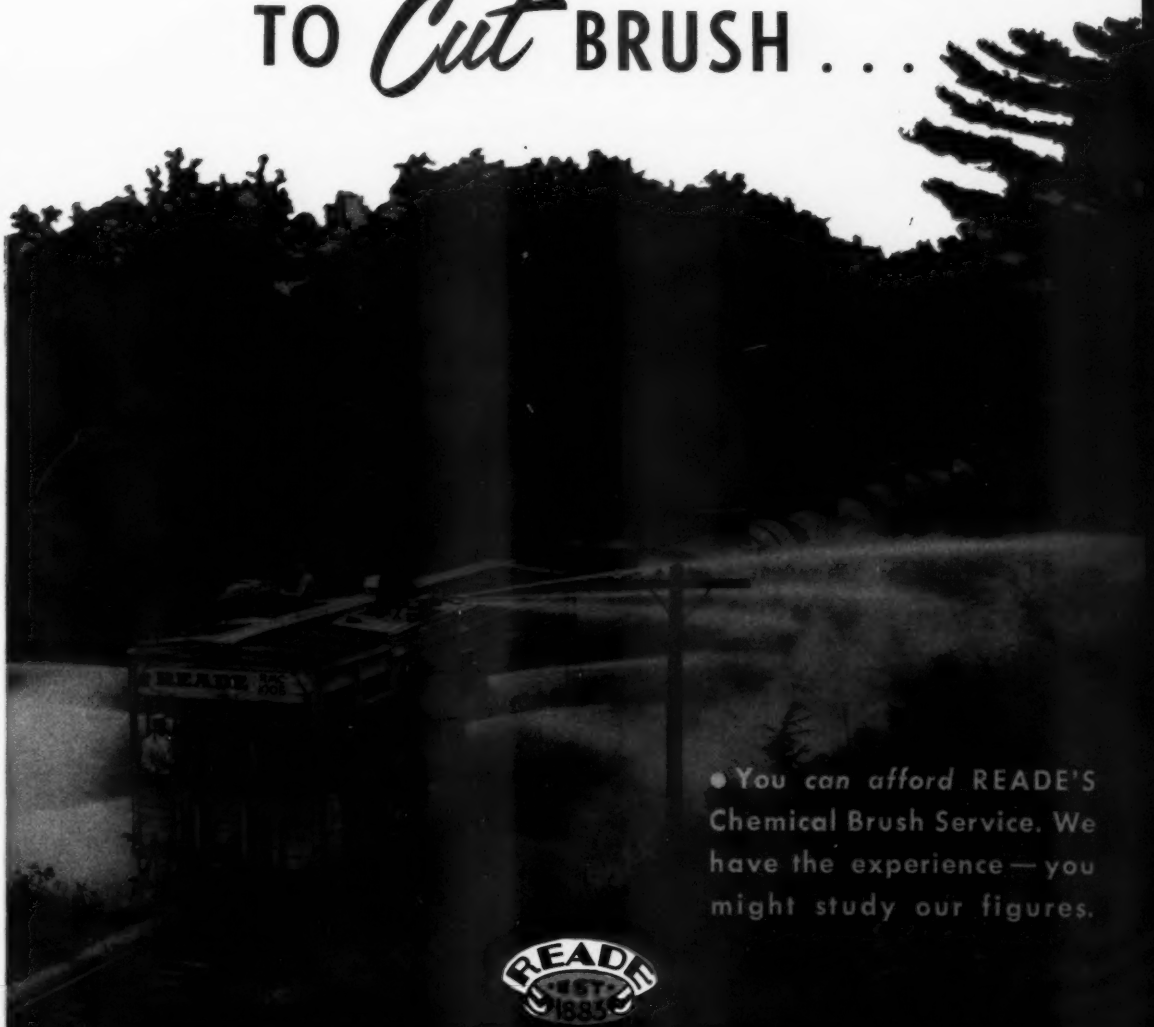
This Issue . . .

Complete Report of Roadmasters' and Bridge & Building Conventions

Contents— page 35

FORMERLY Railway Engineering and Maintenance

YOU CAN NO LONGER AFFORD TO *Cut* BRUSH . . .



• You *can afford* READE'S Chemical Brush Service. We have the experience — you might study our figures.

READE SINCE 1885

READE MANUFACTURING COMPANY, INC.

JERSEY CITY 2, N. J.

WORKS: JERSEY CITY • CHICAGO • KANSAS CITY • MINNEAPOLIS

BIRMINGHAM • STOCKTON

Let Reliance **HY-CROME**® *spring washers*

help you reduce right-of-way maintenance costs

Loose rail joint bolts are a costly never-ending maintenance operation. In back of every Reliance Hy-Crome Spring Washer there are over 35 years of continuing research and development by Eaton Reliance engineers and railroad maintenance-of-way engineers. Reliance Hy-Crome Spring Washers are manufactured specifically to combat rail joint bolt looseness.

Manufactured from special alloy spring steel under rigid metallurgical control in all phases of their production, the inherent reactive pressure and wide reactive range automatically compensate for bolt looseness as a result of bolt elongation, normal wear and vibration created by high speeds and heavy wheel loads.

Put Reliance Hy-Crome Spring Washers to work for you to keep rail joint bolts **tighter longer.**

Write today for Engineering folder R 53.

"SPRINGTITE" AND "HOZ-FAS-NER" ARE REGISTERED TRADEMARKS OF THE EATON MANUFACTURING COMPANY

"Edgemark of Quality"

RELIANCE DIVISION EATON MANUFACTURING COMPANY

OFFICE and PLANTS: 601 Charles Ave., S.E. MASSILLON, OHIO

Special Steels Spring Lock Washers Hoz-Fas-Ners

SALES OFFICES: New York • Cleveland • Detroit • Chicago • St. Louis • San Francisco • Montreal

When the snow falls be ready with

Winter-Kings

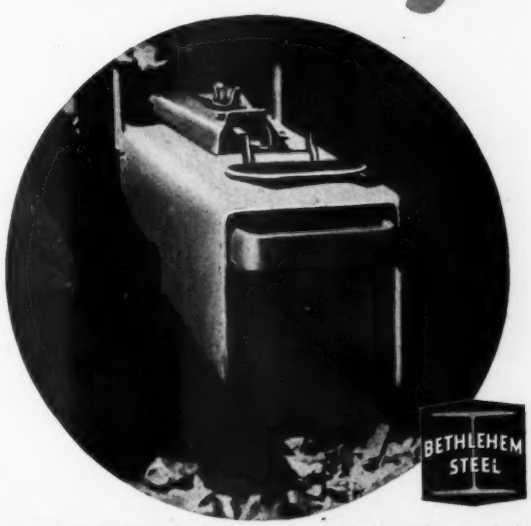
This winter keep your switches open this easy, economical way: put Bethlehem's Winter-King Switch Heaters on the job.

The Winter-King is a kerosene-burning heater that fights snow as it falls, preventing freeze-ups, and eliminating costly and laborious manual removal. It costs mighty little to start with, and you can probably save that first cost in one heavy storm. The Winter-King is easy to maintain: one man can handle about 100 if they aren't too widely scattered.

The Winter-King is simple and compact: 18 in. long, 4½ in. wide, and 5½ in. high. Two flanges at the burner end—to protect ties from the flame—add another 2 in. to the overall height. At one end is the combustion chamber, with rock-wool wick in place; at the other end is the fuel opening with a self-closing cap. This arrangement permits refilling without taking the Winter-King out of service or using a special filling can.

Heat can be regulated by means of a sliding cover which increases or decreases the size of the burner-opening. Only in the severest storms need the burner be blazing at full heat. Under average conditions the Winter-King's 1½-gal fuel chamber holds enough for about 15 hours of continuous burning. Four heaters to a side will safely protect a 16½-ft switch.

A Bethlehem man will be glad to tell you all about the Winter-King Switch Heater. If snow and ice give you switch problems, you'll find it well worth while to hear his story.



BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Published monthly by Simmons-Boardman Publishing Corporation, 79 W. Monroe St., Chicago 3, Ill. Subscription prices: to railroad employees only in the United States and Possessions, and Canada, one year $2.00; $3.00 for two years. Single copies 50 cents. Entered as second-class matter January 20, 1933, at the post office at Chicago, Ill., under the act of March 3, 1879, with additional entry at Bristol, Conn. Volume 50, No. 10.

One of the 160 Uses of CONCRETE on Railroads

NO. 21 OF A SERIES

Concrete structures such as the double-track Elkhorn Tunnel of the Norfolk & Western Railway are enduring improvements that provide greater efficiency and maximum economy.

Concrete railway tunnels are just one of more than 160 uses for portland cement and concrete which enable American railroads to improve service and save time and money. The moderate first cost of such concrete improvements—plus their long life and low maintenance cost—result in *low annual cost.* This saves money for other necessary budget items.

PORTLAND CEMENT ASSOCIATION
33 West Grand Avenue, Chicago 10, Illinois
A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work

Norfolk & Western's *Powhatan Arrow* breaks ribbon to open 7100-ft. Elkhorn Tunnel near Bluefield, W. Va.

THE NORDBERG TRAKLINER

...another
*"Mechanical Muscle"**
designed to save you
TIME AND MONEY

PROVED IN SERVICE

The *TRAKLINER* has been proved in service on leading roads. Experience has shown that extreme accuracy is easily maintained, at savings in excess of $150 a mile.

The *TRAKLINER*, latest addition to the rapidly expanding line of Nordberg track maintenance machinery, provides "Mechanical Muscles" for track lining operations. With this new self-contained, self-propelled unit, you can now do a faster, more accurate track lining job at lower cost.

Built to the same high efficiency standards as all Nordberg Machinery, the *TRAKLINER*, manned by an operator and a helper, moves track laterally any amount desired by the man doing the sighting. The *TRAKLINER* can be operated wherever line stakes, optical instruments or eye sighting methods are used.

Now is the time to plan on using the *TRAKLINER* behind *your* raising gangs and in other lining operations in 1955 . . . for full details about the Nordberg *TRAKLINER*, write for Bulletin 230.

R254-R

USE NORDBERG *"Mechanical Muscles"** TO DO A BETTER, FASTER MAINTENANCE JOB AT LOWER COST

*Trademark

ADZING MACHINE • BALLAST ROUTER • CRIBEX® • BALLASTEX® • SCREENEX® • HYDRAULIC & MECHANICAL SPIKE PULLERS • SPIKE HAMMER • TIE DRILL • POWER JACK • POWER WRENCH • RAIL DRILL • RAIL GRINDERS • TRACK SHIFTER • DSL YARD CLEANER • TRAKLINER • DUN-RITE GAGING MACHINE • GANDY—TIE PULLER and INSERTER

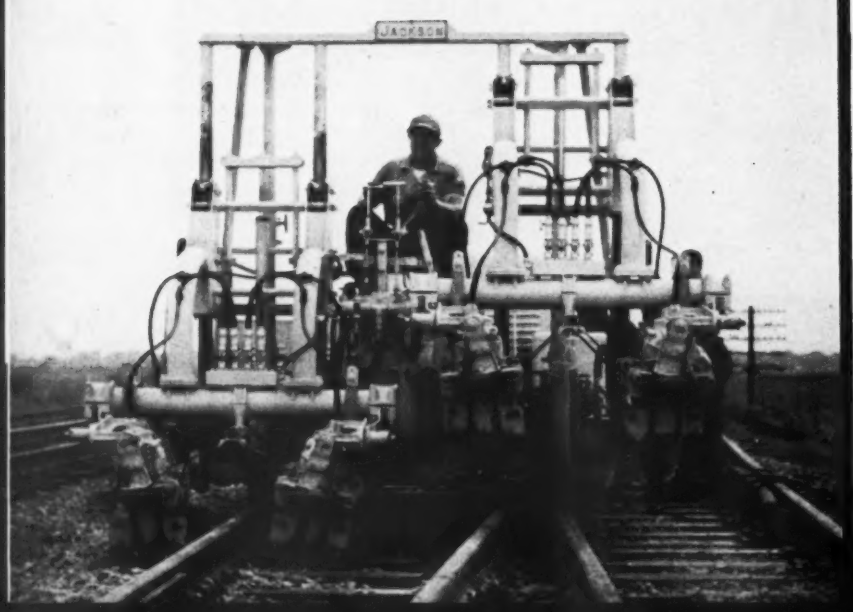
NORDBERG MFG. CO., *Milwaukee, Wis.*

NORDBERG MACHINERY

WE'RE MOVING IN ON THE REALLY *TOUGH* JOBS WITH THE NEW HYDRO-ELECTRIC

JACKSON

TRACK MAINTAINER!



NOW, WITH THIS ONE MACHINE, you can do ALL TAMPING JOBS — with exceptional uniformity, speed and economy.

Unique Action and Tremendous Vibratory Energy produce the superior efficiency of this revolutionary tamper.

Note Divided Work-head Tamping Turn-out

SMOOTHING and SPOTTING *in the* ***HARDEST GOING*** . . . NEW BALLAST INSERTIONS and SURFACING OUT-OF-FACE . . . ***FROM THE HIGHEST TO THE LOWEST LIFTS*** *in all* ***KINDS AND CONDITIONS OF BALLAST.***

. . . Now joining the well-known and widely used Jackson Multiple Tamper and Jackson Hand Tamper in regular production, the TRACK MAINTAINER is available for early 1955 delivery. Write today for your copy of the folder describing this machine.

DO IT BETTER, FASTER & CHEAPER WITH A JACKSON

JACKSON VIBRATORS, INC.

LUDINGTON, MICHIGAN

THE KERSHAW "TRACK PATROL" BALLAST

IT DOES THE WORK OF 10 TO 30 MEN!

HERE'S WHAT THEY SAY ABOUT IT!

From the Eastern United States:

"We estimate that the machine saves approximately ten men and this year's maintenance cost will not exceed $25.00."

Chief Engineer

From the Northeast United States:

"From the use of this Ballast Regulator, it has made it possible to reduce our clean-up gang by ten men. We have had no mechanical breakdowns with either machine."

Division Engineer

From the Western United States:

"The machine which you furnished us has been entirely satisfactory and we are well pleased with its performance."

Engineer Maintenance of Way

From Eastern Canada:

"It is estimated that direct savings in labor were equivalent to the service of thirty men and the total cost of repairs to the machine was $42.00."

Chief Engineer, System

From the Southern United States:

"Our experience with these machines has been quite satisfactory. We have been pleased with their performance. Running repairs thus far have been at a minimum."

Asst. Chief Engineer, MOW

From Western Canada:

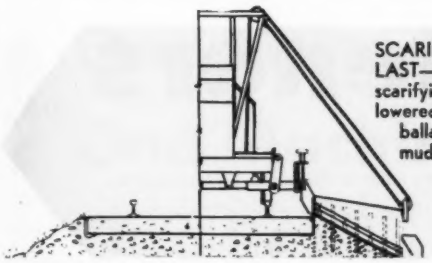
"I can safely say this 'Kershaw' at present saves the work of twenty-five men. It is very economical to operate and repairs should not average more than $100.00 per year."

District Engineer

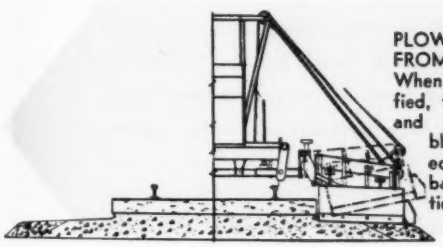
HERE'S

REGULATOR Scarifier and Plow

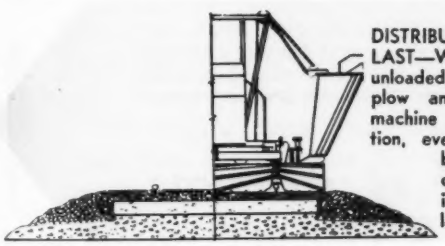
HOW IT DOES THE JOB



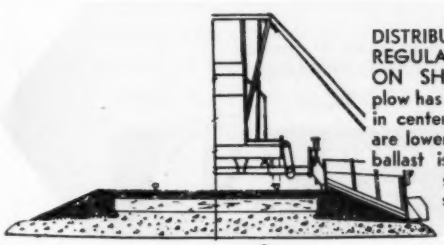
SCARIFYING BALLAST—Wings with scarifying teeth are lowered to scarify ballast and break mud pockets.



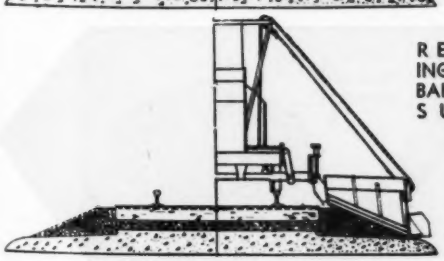
PLOWING BALLAST FROM TIE ENDS—When ballast is scarified, teeth are raised and plow-away blades are lowered to plow the ballast from the tie ends.



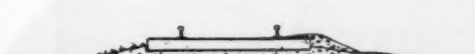
DISTRIBUTING BALLAST—When ballast is unloaded, reverse the plow and operate the machine in forward motion, evenly distributing ballast, filling cribs and removing excess ballast.



DISTRIBUTING AND REGULATING BALLAST ON SHOULDER—After plow has regulated ballast in center of track, wings are lowered and shoulder ballast is regulated and shaped prior to surfacing.



REGULATING SHOULDER BALLAST AFTER SURFACING—Wings are lowered to uniformly regulate and shape ballast shoulder.



DEWEEDING, SCARIFYING, DISTRIBUTING, SHAPING AND RECLAIMING EXISTING BALLAST—Used as a Track Patrol, the Kershaw Ballast Regulator, Scarifier and Plow scarifies, deweeds, reclaims and regulates ballast on 10 to 15

HERE ARE SATISFIED OWNERS & USERS

Chicago, Milwaukee, St. Paul and Pacific Railroad
Chicago and North Western Railroad
*Atchison, Topeka and Santa Fe Ry.
Atlanta & St. Andrews Bay Railway
***Atlantic Coast Line Railroad
Bessemer & Lake Erie Railroad Co.
Boston and Maine Railroad Company
***Canadian National Railways
**Canadian Pacific Railways
*Central of Georgia Railway Co.
**Chesapeake and Ohio Railway Co.
Chicago Great Western Railway
Chicago & Eastern Illinois Railroad
*Chicago, Rock Island & Pacific R. R.
Clinchfield Railroad
Consolidated Railroads of Cuba
*Delaware, Lackawanna & Western Railroad
Delaware & Hudson Railroad Corporation
Duluth, South Shore & Atlantic Railroad
*Gulf, Mobile & Ohio Railroad Company
**Louisville & Nashville Railroad
**Nashville, Chattanooga & St. Louis R. R.
New York, Chicago & St. Louis Railroad
**St. Louis-San Francisco Railway Co.
Carolina and Northwestern Railroad
Interstate Railroad
*Lehigh Valley Railroad
****Southern Railway System
*Southern Pacific Lines
Texas & New Orleans Railroad Co.
Toledo, Peoria & Western Railroad
*Wabash Railroad Company
Central R. R. of N. J.
Reading Company
Western Maryland Railway Company

*Bailes-Sey Contractors
The Deckert Corporation
*Royce Kershaw Co., Inc.
*Mannix Construction Ltd.
W. H. Nichols & Co., Inc.
*T. F. Scholes, Inc.
Ferguson and Edmondson Company
Phelps-Dodge Corporation
Industrial Construction Co., Ltd.
A. S. Wikstron, Inc.
*Wm. A. Smith Construction Co.
*U. S. Army Engineers

*2 to 5 Machines
**5 to 10 Machines
***10 to 20 Machines
****20 to 30 Machines

TRACKWORK EQUIPMENT DEVELOPED AND PROVEN ON THE JOB

Kershaw Kribber • Rail & Utility Derricks • Jack-All • Tie Replacer
Hydraulic Track Jack • Track Broom • Ballast Regulator, Scarifier & Plow
Mocar Crane • Track Crane • Set Offs

GET A KERSHAW BALLAST REGULATOR TODAY, BY ANY ONE OF THESE PLANS:

1. Outright purchase.
2. Six to twelve-months lease with option to purchase, with 90% of rentals paid to apply on purchase price.
3. Three-year lease.

REMEMBER, IF YOU AREN'T SATISFIED RETURN THE MACHINE AND THERE WILL BE NO RENTAL!

KERSHAW
MANUFACTURING CO. INC

MONTGOMERY ALABAMA

FOR CLASS 1 PERFORMANCE, SPECIFY

Lewis **Sealtite** railroad fasteners

Sealtite Hook Bolt

Sealtite Guard Rail Bolt

Sealtite Lag Screw

Sealtite Timber Bolt

*Northern Pacific

*Great Northern Railway

*B&O

*New York Central System

*Illinois Central

*Southern Pacific Lines

*One of many leading railroads using Lewis Sealtite products

The nation's great railroads use Lewis Sealtite fasteners. Accurately engineered, designed to do a better job, Sealtite products are tough, durable, made of finest grade metals for heavy duty. They meet the most exacting specifications.

More than 20 years of manufacturing experience have established Sealtite's top quality in the industry. Such famous Sealtite features as the patented fins, for better seating, Sealtite's accurate threading, for easy installation, and many others, have given Lewis Sealtite products a "Class I" reputation in the field.

The next time you specify fasteners, specify Lewis Sealtite, a complete line of first grade fasteners for America's leading railroads.

All Sealtite products are available in HOT-DIP GALVANIZED, SEALED-IN-ZINC finish, which stops rust and corrosion. Tests prove that the molten zinc bath gives Double-Life, greater economy through fewer replacements.

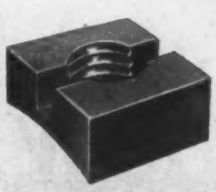
Serving 85% of America's Class 1 Railroads

See your Lewis representative, or contact factory for samples, prices, full details.

All products are manufactured in the U.S.A. to A.S.T.M. specifications

Lewis **BOLT & NUT COMPANY**
504 Malcolm Ave. S. E.
Minneapolis 14, Minnesota

LOOK FOR THIS STAMP OF U QUALITY



Loktite Nut #2

Sealtite Car Bolt

Sealtite Slotted Head Car Bolt

Sealtite Large-Head Car Bolt

Sealtite Washer Nut

Sealtite Bolts available with Loktite Nut #2, washer nut, or std. sq. and hex. nuts.

(Advertisement)

Moving steadily along at 2.0 MPH this HiLoader cleans a track-area of ore, coal and other fine materials. Materials are fed into a high hopper car, towed by a work-train.

One Man...
One Machine...
One Pass...
Cleans Full Tie-Length

More track cleaned, less manpower used—that's the record of the Athey Force-Feed HiLoader Track Cleaner. Railroad owners in various parts of the country are proving this by actual use of this off-track machine.

The HiLoader Track Cleaner is under complete control of one man in the comfortable cab. Controls for the auger and paddle-blade feeder are hydraulic, and a slight shift of a convenient lever provides precision movements at the cutting edge. The tough, rubber-covered, steel-cleated conveyor belt moves or stops at the turn of a lever. The discharge conveyor swings 55° to either side of center under hydraulic control. Steering is accomplished by a truck-type steering arrangement, with a wheel that handles like a small truck. Foot and hand throttles simplify crowding while loading.

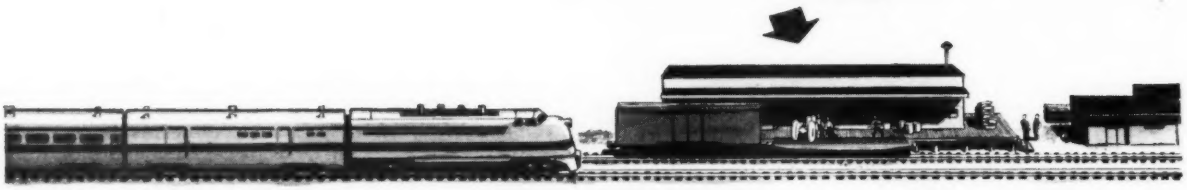
The HiLoader has a 98-inch gather to clean both between the rails and the inter-track area. Up to 10 cubic yards of loose material can be loaded each minute. Steel augers keep materials feeding into the floating paddle-blades. The blades rise and fall to match the contour of the material. A 101 HP industrial engine provides ample power for loading at 2.0 MPH or traveling between work areas at 20.0 MPH.

Oversize tires enable the HiLoader to maneuver over rails without damage. Regular train schedules need not be interrupted for track-cleaning crews. Weight is concentrated on the drive wheels for traction in soft-footing, cinders or snow. The conveyor is the right height for reaching into the highest hopper car or for casting material away from the tracks.

Make your track cleaning a one-man, one-machine operation with the Athey HiLoader Track Cleaner. Your Athey-Caterpillar Dealer can give you complete information or you can write direct to **ATHEY PRODUCTS CORPORATION, 5631 WEST 65TH STREET, CHICAGO 38, ILLINOIS.**

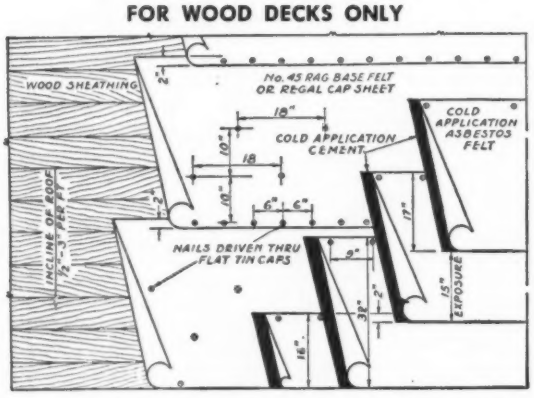
Tunnels in the cutting edge protect the rails, as the HiLoader does its work. The tunnels can be hooded for other types of loading tasks.

When your hard-to-reach buildings need reroofing



...Johns-Manville Cold Application Built-Up Roofs offer economical application by company crews

FOR WOOD DECKS ONLY



Plan showing method of laying Johns-Manville Cold Application Built-Up Roof.

For further information, regarding this and other types of Johns-Manville roofs, see your J-M Representative, or write Johns-Manville Box 60, New York 16, N. Y.

WHEN reroofing is necessary on small buildings located in remote places along the right of way, it is often impractical to apply the conventional hot application built-up roof.

To meet such conditions, Johns-Manville has developed an Asbestos Cold Application Built-Up Roof. The roof is made up of special Johns-Manville Asbestos Felts that are cemented together in application with a cold applied cement brushed in place.

This eliminates the need for roofing kettles, and saves the time required to heat the binders used when hot application roofs are applied.

Built for long years of service, Johns-Manville Cold Application Built-Up Roofs offer an economical and practical method for roofing small new buildings and replacing those on old buildings.

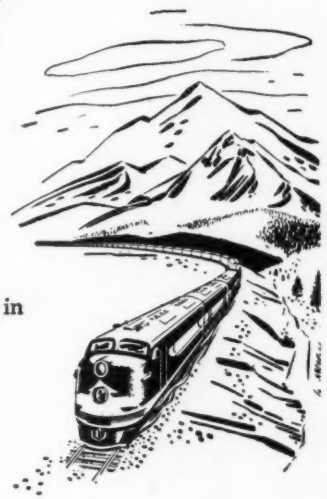
JOHNS-MANVILLE JM PRODUCTS **Johns-Manville** 95 YEARS OF SERVICE TO TRANSPORTATION

"QUICK-WAY" digging drainage ditch.

"QUICK-WAY" used in rehandling manure.

"QUICK-WAY" dragline moves ballast.

"QUICK-WAYS" VS. WORK TRAINS



Used to **SAVE MONEY** in handling materials, relaying rails and maintenance on all parts of the system, 4 machines in Seattle, 3 in Montana Districts, 2 in Duluth-Minneapolis, 1 in Lewiston, Idaho, 1 in Spokane, 1 in Portland.

After an initial test of one machine in 1947, a total of 12 "QUICK-WAYS" are now used for the following purposes:

1. **For rail yards in piling new and used rails, loading and unloading rails.**
2. **For rail relay work, handling and placing up to 125 rails per day.**
3. **For ditching, laying pipe, drainage and back-filling along right-of-way.**
4. **For handling heavy timbers on bridge work.**
5. **For removing ballast between double tracks.**
6. **For rehandling manure removed from stock cars.**

Tremendous savings are being made by use of small machines which move between jobs on highways and work on and over railroad beds saving expense of work trains doing rail relay, ditching and drainage work along the right of way and handling numerous small jobs over the entire system which large machines cannot handle with any degree of efficiency due to their size, weight, and excessive cost of transportation.

"QUICK-WAYS" have dozens of uses in numerous types of jobs—handle aggregate, building materials, excavation work, dig ditches, drive pile, pour concrete, set steel, etc. Easy to move from job to job. Numerous attachments. Four new models now available from 3 to 10 ton crane capacity.

Only **"QUICK-WAY"** *gives you* "QUICK-WAY" quality construction—all steel for strength and lightness, accurate balance, high capacity to weight ratio. Ask your distributor for a free demonstration.

"QUICK-WAY" with crane attachment loading rails from stock pile to flat car.

"QUICK-WAY" TRUCK SHOVEL CO • Denver, U.S.A.
Reg. U.S. Pat. Off.

Mail Coupon Today!

"QUICK-WAY" TRUCK SHOVEL CO.
Dept. 174 • 2401 East 40th Ave.
Denver, Colorado • U.S.A.

Please send me complete details on "QUICK-WAY" Truck Shovels —four different models from 3 to 10 ton crane capacity.

Name _____

Address _____

City _____ State _____

Here Monotubes are being driven to support a railroad overpass.

Monotube *Foundation Piles*

Will fewer piles meet your load requirements?

. . . check these MONOTUBE features!

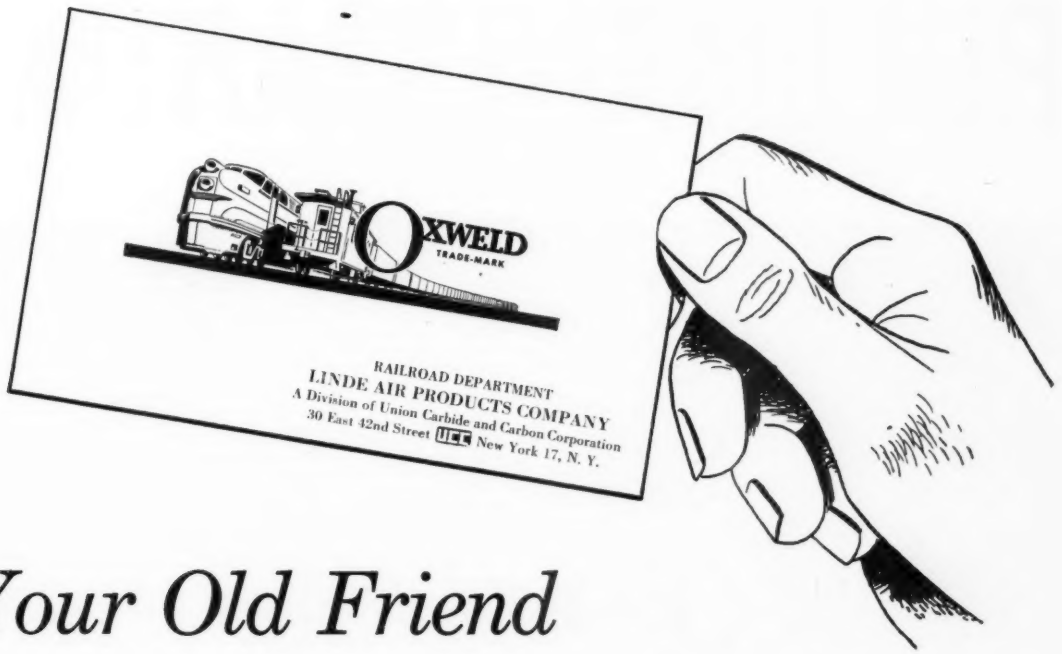
THIS question about *fewer* piles is something you might want to check into carefully, because it could save plenty of dollars. Here's a start . . .

Monotube piles have exceptional bearing capacity. There's plenty of data and proof on their excellence in transmitting loads to the penetrated soil. This, plus visual top-to-bottom assurance of their condition after driving, permits designing for heavy loads.

Consider, too, Monotubes' high-strength, cold-rolled construction, field extendibility, and large-area vertical fluting. Everything adds up to important design possibilities and new construction economies.

For additional, specific data, write to The Union Metal Manufacturing Co., Canton 5, Ohio.

UNION METAL



Your Old Friend Presents a New Card

The men you have known as representatives of Oxweld Railroad Service Company will now be calling on you as representatives of the newly formed Railroad Department of Linde Air Products Company.

The combination of these two Divisions of Union Carbide and Carbon Corporation has been effected so that you may be better served and have the full benefit of the combined knowledge and facilities of both organizations. Men of the OXWELD organization bring to the new Railroad Department years of valuable experience and a thorough knowledge of the railroad industry.

LINDE men, in turn, bring wide skill in welding and cutting applications in a broad range of other industries that may be adapted for railroad use. In addition to your old OXWELD friends you will soon meet other LINDE representatives for the first time. You may be sure that these new friends will be just as helpful and co-operative as the OXWELD people who have served you in the past.

LINDE's coast-to-coast chain of District and Region Offices will now be able to serve more closely the needs of the railroad industry for apparatus and welding supplies, and the helpful technical service for which both LINDE and OXWELD have long been noted.

"Linde" and "Oxweld" are registered trade-marks of Union Carbide and Carbon Corporation.

RAILROAD DEPARTMENT
Linde Air Products Company
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
Offices in Other Principal Cities
In Canada: DOMINION OXYGEN COMPANY
Division of Union Carbide Canada Limited, Toronto

Linde
Trade-Mark

PULLMAN-STANDARD

Pullman-Standard Power Cleaner and Winch Car Team—For the first time both track shoulders can be cleaned simultaneously at 1000 to 1200 feet per hour with only four men. Even in multiple track territory, the shoulder plus half the six-foot are cleaned to a depth of eight to ten inches below the tie base at the same high rate and with the same low labor complement. Your ballast cleaning costs can be reduced by as much as 50%.

Pullman-Standard Power Ballaster—With a production rate of 500 to 700 feet an hour, a Pullman-Standard Power Ballaster, run by a single operator, can be efficiently manned by a crew of 10 to 15 men. Case history studies made on 16 railroads prove that this unit will give more feet of finished tamped track per hour, with less labor and maintenance, than any other production tamper.

Pullman-Standard Power Cribber—The Pullman-Standard Power Track Cribber gives you two cribs a minute, with a single operator. With a normal production rate of 150 to 400 track-feet per hour, its interchangeable 4-, 5-, and 6-inch digger tips enable it to crib efficiently and economically in any type of ballast, regardless of cementation.

D POWER CLEANER and winch car team

- distributes cleaned ballast wherever required
- cleans both shoulders at the same time
- works to a depth of eight to ten inches below tie base
- requires only one operator for each car and two laborers
- work rate is 1000 to 1200 ft. per hour
- forward or reverse running speeds of 25 mph
- power winch car develops up to 30,000 pounds of tractive force
- units have lateral set-off
- Each machine can be run independently or can tow the other

Be sure to get all of the facts about Pullman-Standard Power Track Maintenance Equipment. Write or phone the nearest office.

YOUR NEEDS CREATE THE PULLMAN "STANDARD"

PULLMAN-STANDARD

CAR MANUFACTURING COMPANY

SUBSIDIARY OF PULLMAN INCORPORATED

79 EAST ADAMS STREET, CHICAGO 3, ILLINOIS

BIRMINGHAM, PITTSBURGH, NEW YORK, SAN FRANCISCO, WASHINGTON

More t

D Tournapull makes sharp 90° turn to drive under trestle. Fill is now only 15′ wide on each side of trestle. Eventually fill will extend only 10′ beyond the trestle, but maneuverable "D" will still be able to turn.

Tournapull has plenty of room as it drives beneath trestle in space only 14′ wide between bents. When fill is complete, a dragline will close gaps left open at each end for Tournapull. Earth will be brought within reach by the "D".

Fernwood, Columbia & Gulf Railroad Company, Fernwood, Mississippi, has only 44 miles of track but used to have 60 bridges and trestles. Besides requiring constant maintenance, plus constant brush and weed removal along the right-of-way to avert fire danger, these wooden structures had to be replaced every 20 years or so.

Recently, company officials decided to replace bridges and trestles wherever possible with earth fills. At first they used a work train to carry out this program. Then, they bought a D Tournapull.

Typical job shown

A typical trestle replacement project is pictured here. After installing a culvert, the railroad is building up a fill 300′ long, 26′ high, 80′ wide at the base, and 35′ wide at the crown. It will require 16,600 cubic yards of earth brought in from borrow pits about 500 feet from either end of the long trestle.

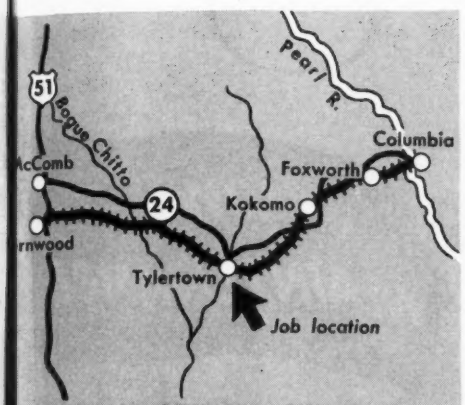
Fill is heaped beneath the trestle as well as alongside. When it is brought to track level, it will be allowed to settle for about a year. Then the tracks will be taken up, salvageable portions of the trestle removed, and the track re-laid. So far, 23 of the structures have been replaced. Only 8 of the 60 trestles cannot be eliminated.

The D Tournapull is push-loaded by a 76 hp crawler-tractor with 5 pay yards of hard red clay. Working 2000′ to 2400′

Big, low-pressure tires do no damage to rails or ties as Tournapull crosses tracks. Straddling rails or following right-of-way, this machine can also travel anywhere a train can go.

e than pays for itself

— by eliminating trestle repair



FERNWOOD, COLUMBIA & GULF RR, Miss.

cycles, the "D" delivers 18 loads or 90 cu. yds. in a 55-minute hour.

Reduces manpower 57%

To speed completion of this particular job the railroad brought in two 30-yd. side-dump rail cars pulled by locomotive. Cars are loaded by a 1¼-yd. dragline at another pit. This train delivers its 2-car load every 30 to 45 minutes. Production varies from 80 to 120 cu. yds. hourly.

Under ideal conditions, the work train could haul 700 pay yards in an 8-hour day. But it must move to a siding whenever revenue traffic is due, halting production. The work-train method requires a train crew of 4, a dragline operator and helper, and a dozer operator on the fill. As much as 3 to 4 hours must be allowed for travel time. 7 men and 5 expensive pieces of equipment are necessary.

Only 1 man per machine

With D Tournapull, on the other hand, only 3 men are required: operators for the "D" and the 2 tractors. Both the pusher and the tractor on the fill could handle 2, 3 or even 4 D Tournapulls on this particular assignment if the railroad had them. At the end of the shift, Tournapull can either drive back to the yard or be left on job without blocking right-of-way. The 3 operators return home on track via motor car, or in their own automobiles.

Tournapull has also cut and cleaned out ditches. When trestle replacement program is completed, "D" will be assigned to cut down grades which run as steep as 2½ to 3% on some sections of the line. By eliminating grades, owners figure they will be able to handle 4 times more tonnage with ½ the present motive power. At present the line has 6 General Electric "44" diesel locomotives and moves 800 to 1200 cars a month.

Will work on another road

D Tournapull has still more years of work before it. The F. C. & G. recently purchased the 27-mile Bonhomie & Hattiesburg Southern Railroad Company. Eventually, the "D" will replace trestles and bridges on this railroad, also.

The handy "D" drives job-to-job under its own power, over highways or along the right of way. For example, it made a typical 60-mile trip by highway in just a little over 2 hours. At the time this report was written, Tournapull had worked a total of 987 hours and downtime for minor servicing totaled only 25 hours.

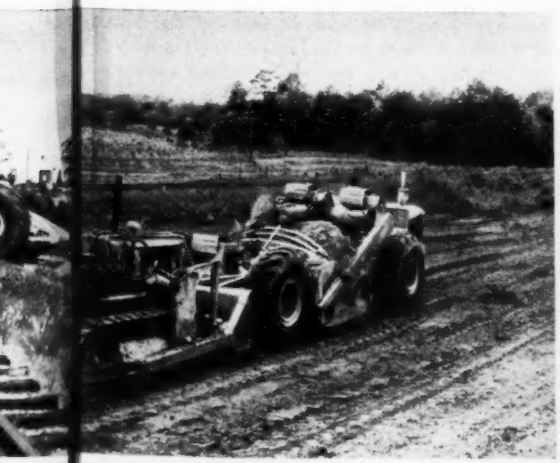
"Nothing performs like the 'D' "

Says General Manager T. J. Pittman: "Nothing performs like the Tournapull. The D Tournapull has done everything I expected and then some. We've filled bridges, cleaned out ditches, and built fills. We like the machine, too, because it can maneuver so well. It will work in a narrow space which means we can build a narrower fill. We bought the 'D' because of its maneuverability and the fact that it can go in between bridge bents, where other equipment can't go."

Operator John D. Greenlee adds: "I like to run the D Tournapull. Operating this machine just comes natural. I like the power the machine has. No trouble at all to maneuver with this rig."

Get all the facts

D Tournapull is built by LeTourneau-Westinghouse, a wholly-owned subsidiary of Westinghouse Air Brake Company. That name on any piece of equipment has been synonymous with quality, safety and satisfactory railroad service for nearly 100 years. Write us today to arrange for a demonstration of the "D" on your railroad.


Tournapull gets heaped load of clay in slightly more than half a minute with the aid of a pusher. Rubber-tired dirtmover also self-loads

Spreading on the run, Tournapull puts down fill in even, accurately-controlled layers. Passage of the machine across the fill makes further mechanical compaction unnecessary.

FREE..."The Railroad Handyman"

20-page book shows how 7-yd. self-loading D Tournapull cuts time and costs on right-of-way maintenance. Send coupon for your free copy. No obligation. Also ask to see our color movie, "Clear The Track".

Name .....

Title .....

Railroad .....

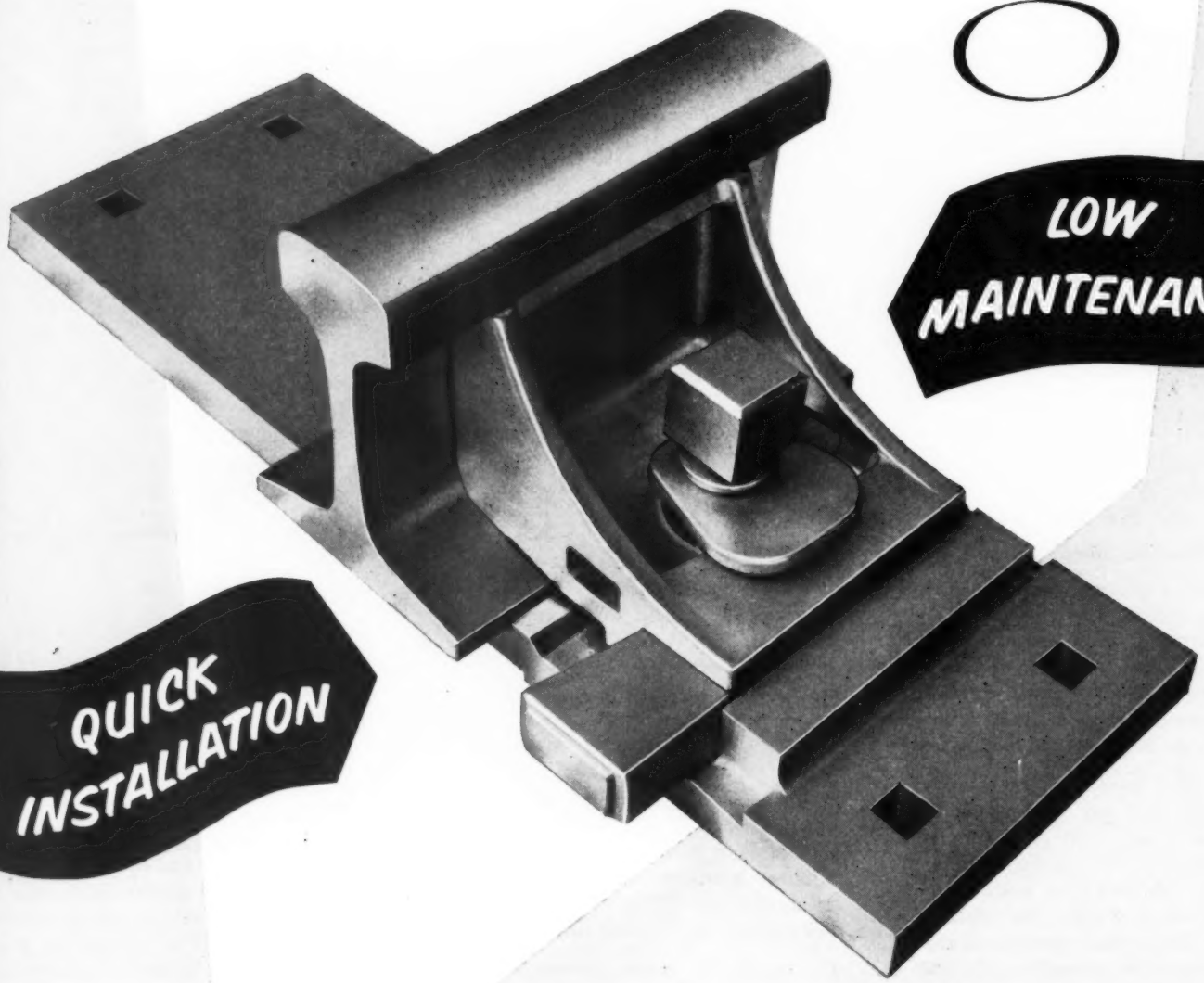
Address .....

LeTourneau-Westinghouse Company

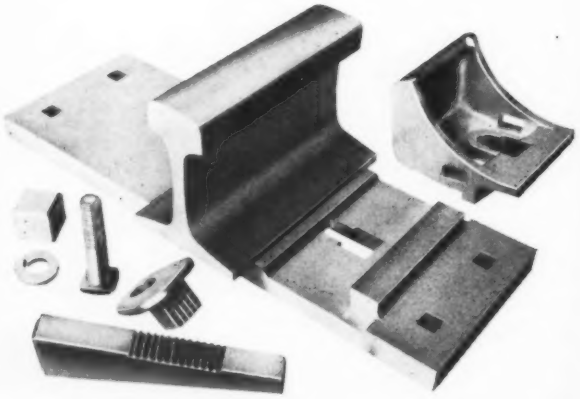
PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

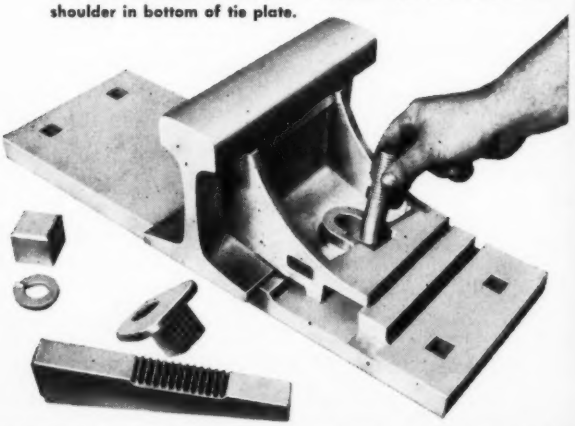
Introducing- - -



1. Assembly takes place after the rail is seated on the plate and plate has been spiked to the tie.



2. Brace is snugly fitted into the fishing of the stock rail. Bolt is then inserted from the top with the head down, moved in toward the rail until bolt head is positioned and held under shoulder in bottom of tie plate.



The New, Self-locking USS Taylor Adjustable Rail Brace

THE new Taylor Adjustable Rail Brace offers advantages found in no other rail brace. Combining the simplicity of good design with rugged construction, it insures sturdy rail support – takes the repeated side thrusts of heavy, fast traffic without loosening, thus maintaining track gage and alignment.

Installation is quick. Rail, tie and plate need not be disturbed. And once installed, the USS Taylor Adjustable Rail Brace is *locked* in position. Even if the cap nut becomes loosened, the locking plate with its serrations interlocking those of the wedge will continue to hold the wedge in the proper position. The bolt serves merely as an anchor for the locking plate plug, while the cap nut and shielded locking plate protect the bolt threads against corrosion.

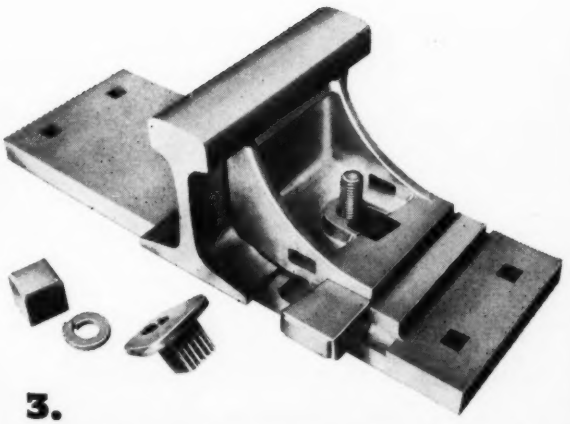
Maintenance on this type of brace is rarely necessary

The efficient design of the Taylor Adjustable Rail Brace results in less wear, a minimum of adjustment and longer service life. When adjustment is required (due to wear), the locking plate plug is simply lifted and the wedge tapped in with a hammer.

For further information, write to United States Steel Corporation, 525 William Penn Place, Room 4505, Pittsburgh 30, Pennsylvania.

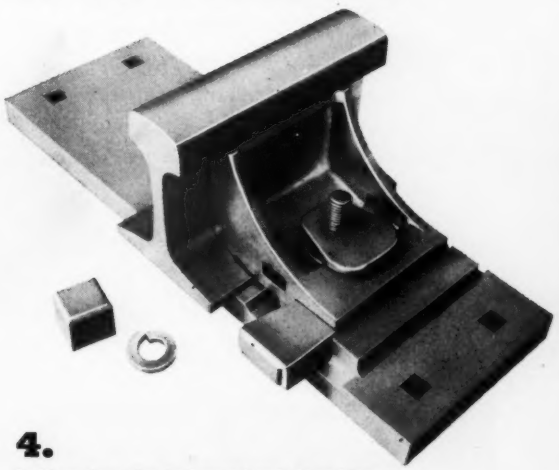
UNITED STATES STEEL CORPORATION, PITTSBURGH • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS TRACKWORK



3.

Wedge is then driven tight with its serrations facing the rail. Opposite side of wedge is inclined to fit the undercut face of the stop block.



4.

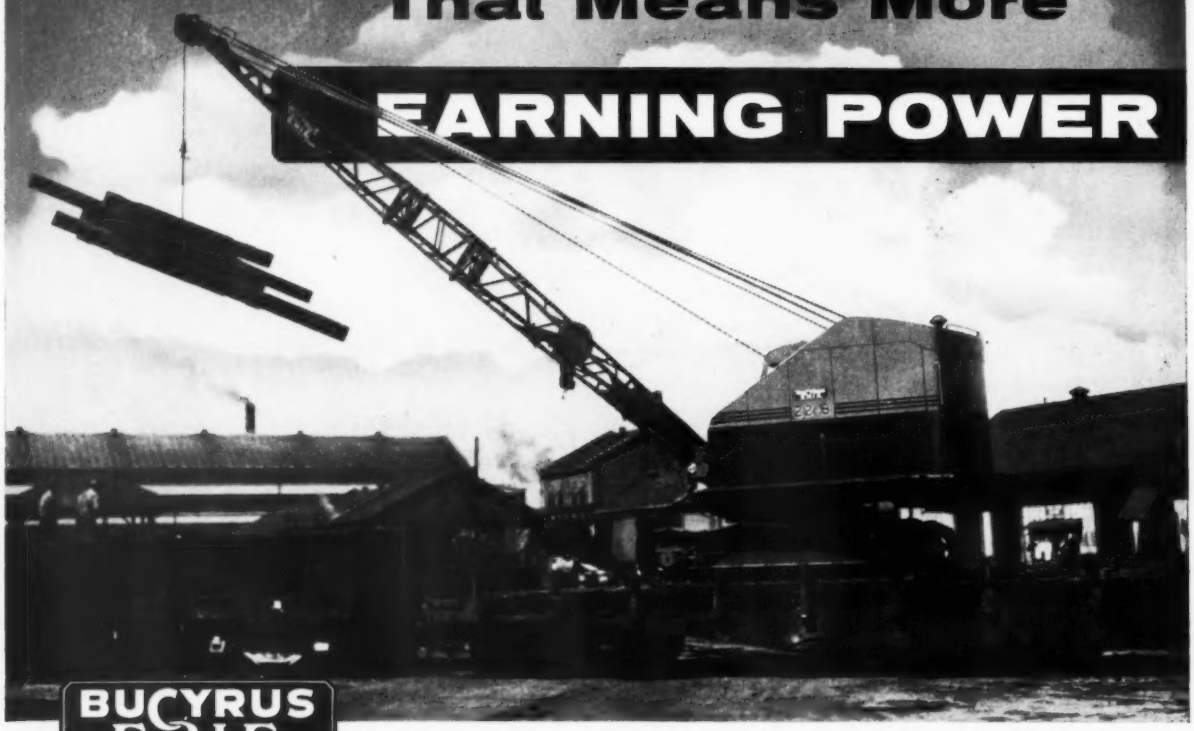
Locking plate plug is dropped on bolt and into hole in brace. Serrations on outer face of plug engage those of the wedge, while inner smooth face of plug engages the vertical shoulders of the brace. Spring washer is then placed on bolt, and cap nut is applied and tightened.

USS

UNITED STATES STEEL

WORK POWER

That Means More EARNING POWER



BUCYRUS ERIE

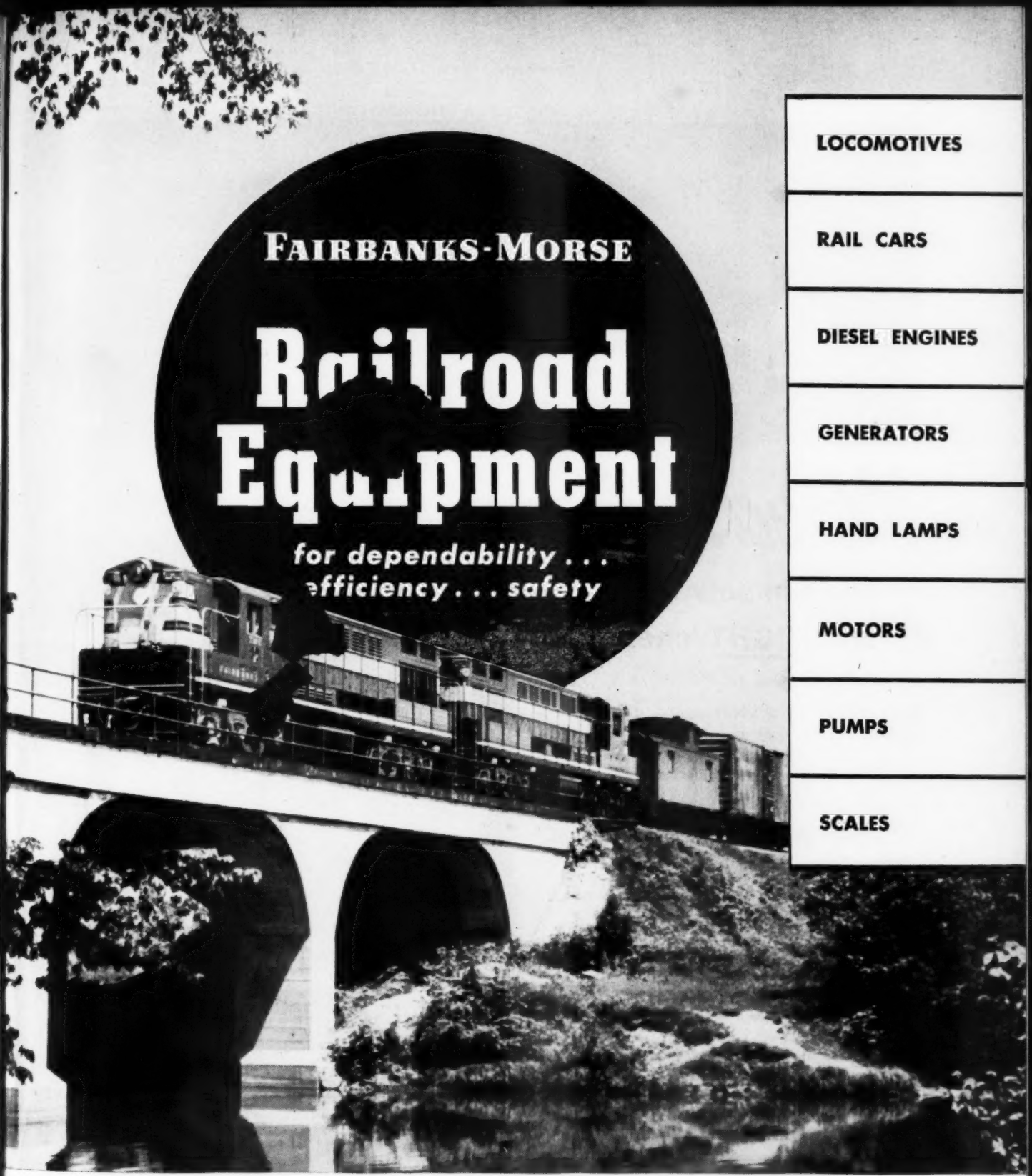
Stockpiling rails and ties, unloading trash from cars, handling wheel assemblies in and out of storage, handling aggregates — yard jobs like these won't support high operating costs. That's why more and more railroads are using convertible Bucyrus-Erie crane-excavators for such work.

Speed and efficiency are packed into whatever work a Bucyrus-Erie handles. Big engines "tailored" to fit the work range of each size machine produce power to meet all demands of crane and excavator service. Large, cool-running clutches and brakes, responding smoothly to conveniently placed controls, provide accurate control for precision crane work, deliver power where it counts for excavator operation—enable the operator to hoist, swing, and dump a load with the quick sureness that spells speedy job completion.

Bucyrus-Erie excavators (shovels, draglines, and clamshells) range in size from ⅜- to 4-cu. yd.; crane capacities range from 3- to 60-ton (nominal ratings). Transit Cranes (carrier mounted) with 15- and 25-ton capacity — easily convertible to ½- and ¾-yd. excavator operation — are available also. Let your Bucyrus-Erie distributor show you how these famous machines can reduce yard work costs for you. 40E54

Bucyrus-Erie Company

South Milwaukee, Wisconsin



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a name worth remembering when you want the best

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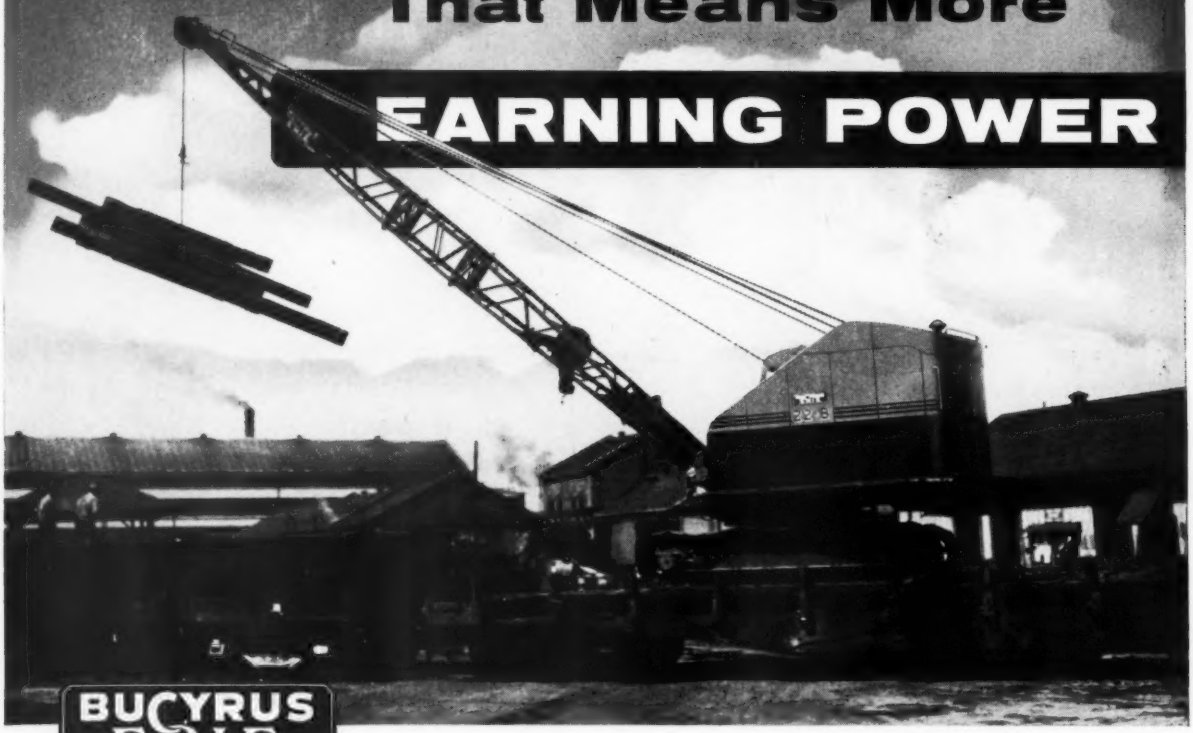
WORK POWER

That Means More

EARNING POWER



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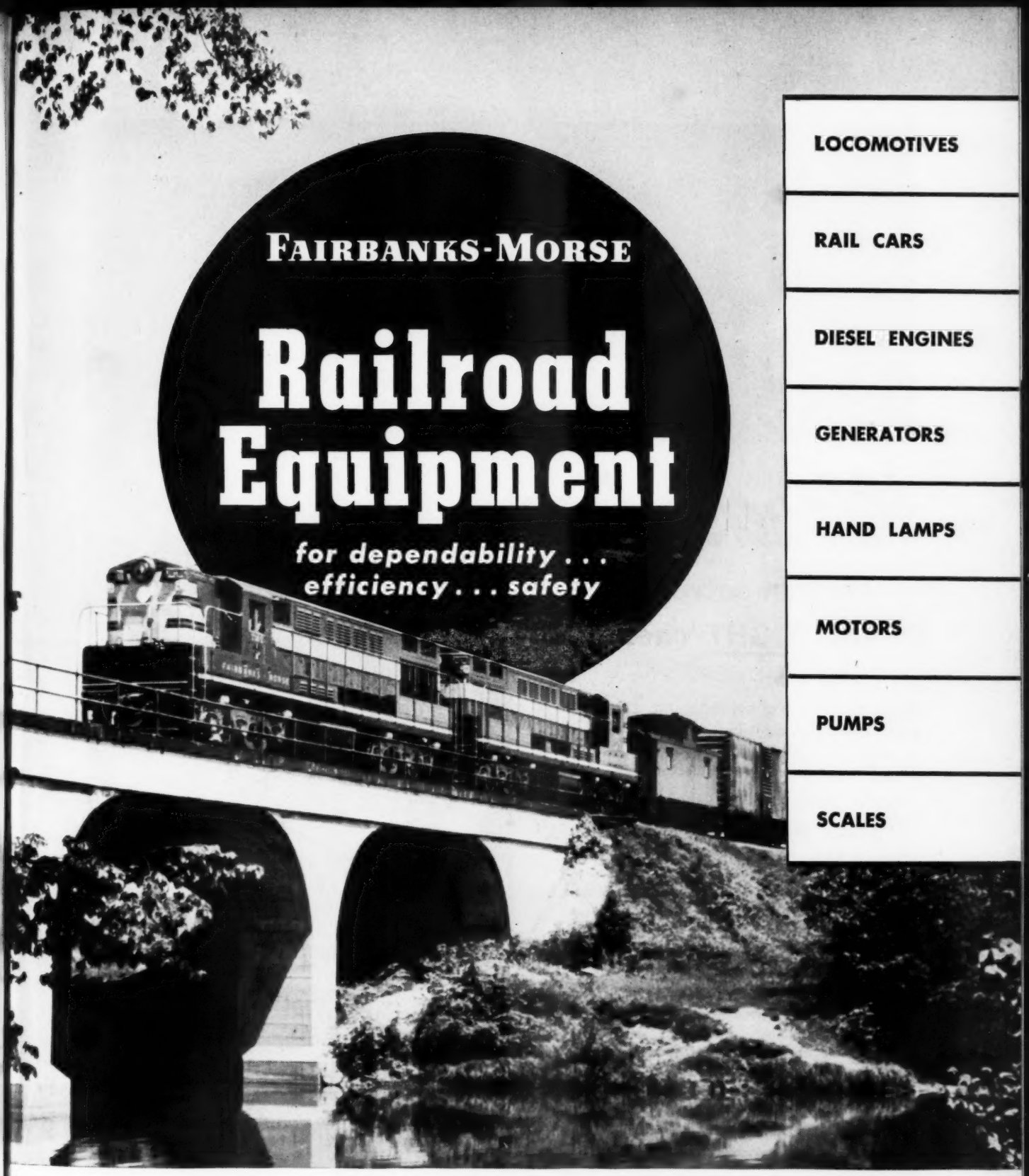

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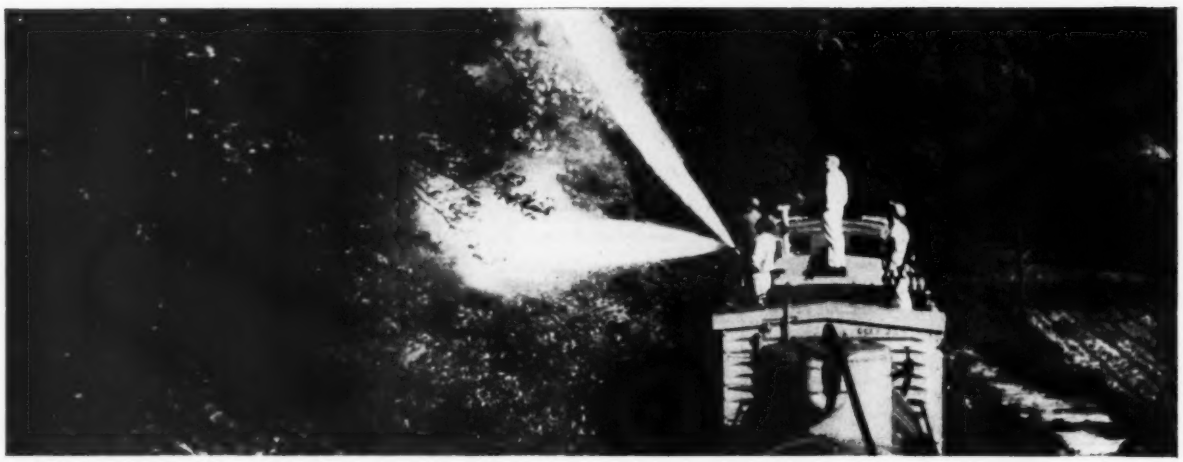

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We can solve YOUR weed control problems with the RIGHT chemicals and application service

Our complete line of proven weed, grass and brush killing chemicals includes:

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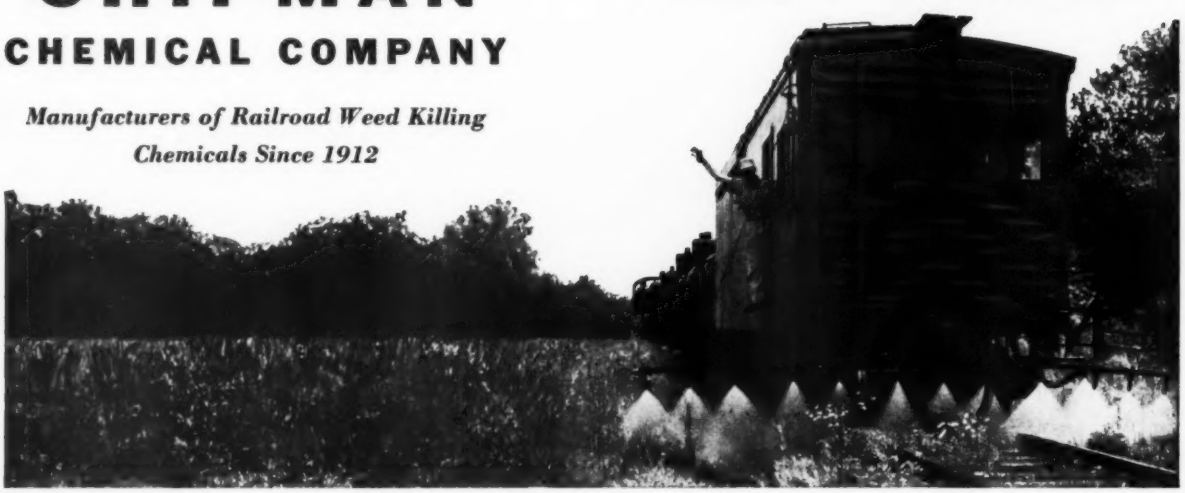
16 Strategically Located Chipman Plants

CHIPMAN
CHEMICAL COMPANY

Manufacturers of Railroad Weed Killing Chemicals Since 1912



Works on or off the rail-propulsion car with all shovel or crane attachments

You get more productive work-time

because Koehring 205 saves travel-time . . . powers its own rail car

With Koehring 205 RailAid, it's not necessary to move off-track over round-about routes from one work section to the next. Self-powered RailAid travels on-track at speeds up to 20 m.p.h. . . . does 2 to 3 times the work of conventional excavators and cranes that have to crawl or be hauled from job to job.

You can send RailAid anywhere along the line at a moment's notice to do any digging, lifting or material-handling. It works on or off-track . . . cleans ditches, widens embankments, stock-piles coal or ballast, loads and unloads cars, repairs trestles, lays rails, does pile-driving, handles scrap or salvage.

It loads or unloads itself on ramp-equipped car in less than 10 minutes. Crane or excavator sets car on and off-track . . . clears the right-of-way for normal through traffic. Propulsion car has 2-axle drive, with airbrakes on all 4 wheels. Torque converter gives smooth control of 20 m.p.h. travel speed. Wide car-"well" accommodates 16, 20 or 24-in. crawlers on excavator or crane. Versatile Koehring 205 gives you ½-yard dipper capacity as a shovel or hoe. As a crane it safely lifts 6.9 tons from car, 8.9 tons on ground . . . converts to clamshell, dragline, pile-driver. For more facts, write: *Koehring Company, Milwaukee 16, Wisconsin.*

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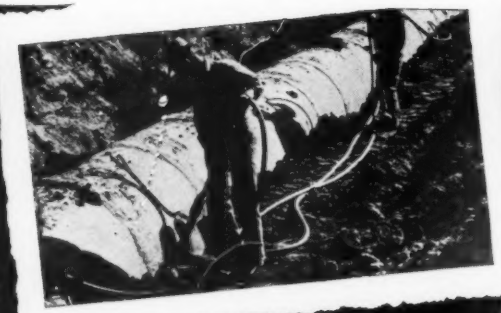
K454

(Subsidiaries: **KWIK-MIX • PARSONS • JOHNSON***)*



Firming up around the new culvert.

How we laid cable through the hardpan.

Snapshots by the section boss...

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of **GARDNER-DENVER** Air Tools

We broke out that old station platform in a hurry.

Some well-placed dynamite cleaned out the old drainage ditch.

This pump kept our feet dry while we worked on the bridge.

SINCE 1859

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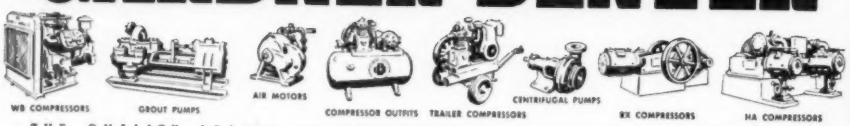

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Illinois
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FULL VISION means you'll Move More with a MICHIGAN

Step into a MICHIGAN* cab, and sit in the operator's comfortable seat. Notice how easy it is to follow every move on the job. 3604 square inches of glass!—see what excellent vision is provided, in all directions and overhead.

Here, indeed, is a masterpiece of smart modern design: a truly functional cab—fully ventilated, quiet; a comfortable cab designed to make the operator's job as easy as possible. Look, also, at the outside of the cab; at the adjustable louvers on both sides for good ventilation; the sliding rear doors that make it easy to get at the engine; the rear window to complete the full-vision facility.

For an easy point-for-point comparison of the MICHIGAN with other machines, send for the MICHIGAN Fact Folio: contains full information, including an interesting book "More Yardage Through Air Power." The coupon gets prompt action.

**A Trademark of Clark Equipment Company*

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17

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Construction Machinery Division
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Please send the MICHIGAN "24" Fact Folio

Name_____ Title_____

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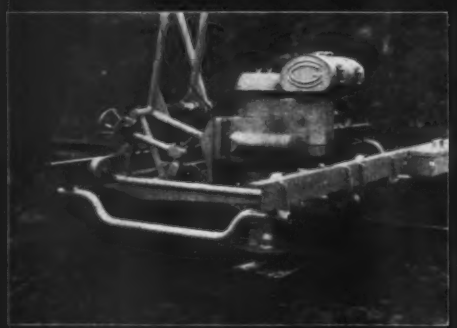
LET Matisa DEMONSTRATE SCIENTIFIC RAILROADING *On your track!*

THE NEW Matisa ADZING MACHINE

Adze under traffic and under both rails simultaneously without removing rails. Removes effects of tie-plate cutting. Makes gauging easier, more economical. Extends crosstie life.



THE NEW MODEL Matisa TIE RENEWAL MACHINE

Takes old ties out, puts new ones in at half cost — *in a fraction of the time* — of old style methods. Leaves no rough track behind. Knurled steel rollers move ties in either direction with the flick of a lever, spotting them precisely where wanted.

THE Matisa POWER WRENCH

Predetermined, *constant* torque to equalize bolt tension. Light weight, heavy duty, precision application.

Write us for a demonstration or for literature

Matisa EQUIPMENT CORPORATION

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TRACKWORK SPECIALISTS ALL OVER THE WORLD

NEWS NOTES...

OCTOBER, 1954

...a resumé of current events throughout the railroad world

Public reaction to its first bilevel dome lounge car has been so favorable, according to reports from the Southern Pacific, that the company is going to build six more cars of this design in its shops at Sacramento. It is expected that the cars will be in service by the early part of 1955. The basic difference between the SP's car and other dome designs is that part of the space under the glass roof is at conventional floor height and part is raised to approximately the same height as other dome-car equipment.

•

The Southern Pacific-Union Pacific Speedway yard at Ogden, Utah, recently went into operation. The new $4-million facility is designed to speed freight traffic through the Ogden gateway. As part of the project, Pacific Fruit Express has increased its icing platform capacity by 220 cars, and can now ice full-length unbroken trains; icing facilities have been completely mechanized.

•

The Seaboard Air Line reports that summer vacation travel on its road between Eastern points and Florida "showed a tremendous increase this past July over the same month last year." At New York, sales of 30-day low-fare roundtrip coach tickets were up over 100 per cent, while in Florida they showed an increase of 35 per cent. The number of all-expense "package tour" passengers was triple that of last year.

•

Net income, after interest and rentals, of Class I railroads during the first seven months of this year was down $218 million from the corresponding period last year. Net income this year was $272 million as compared with $490 million in the first seven months of 1953.

•

Diesel locomotives can now be started or stopped by remote control using a telephone device now in service on the Pittsburgh & Lake Erie. Engines at various remote points on the road can be connected to a central control point through plug-in stations located along tie-up tracks. A set of indicator devices notifies the operator at the central control point of engine freezing or overheating, unauthorized movements or vandalism. A system of coded controls enables the operator to start an engine or shut it off as desired.

•

Air-coach travel showed a 37 per cent increase and marked the continued rise of the airlines' share of total passenger-miles in 1953. Total passenger-miles logged in air-coach travel in 1953 were almost 15 times greater than in 1949, the first full year of air-coach service.

•

"Railroad Week" will be held in Buffalo, N. Y., from October 15 through October 22, and will feature a specially-planned city-wide program to honor the railroads serving Buffalo, and the industry of which they are a part. Highlights of the week will include an exhibit of railroad equipment, a tour of local railroad facilities, the placing of a steam locomotive in a city park and a series of meetings and addresses.

WHEN YOUR TRACK BALLAST NEEDS CLEANING...

CALL ON

SPENO
BALLAST CLEANING SERVICE

SPENO contract service eliminates capital investment by Railroads in this single-operation equipment.

SPENO'S double screening system gives a thorough cleaning in less time than a single screening by other mechanical means.

SPENO Ballast Cleaning Equipment does not foul train traffic on adjacent tracks.

SPENO'S record of high production and low cost can be verified by the sixteen Class I railroads now served.

Just ask the Railroads that have used us.
FRANK SPENO RAILROAD BALLAST CLEANING CO., INC.
306 North Cayuga St., Ithaca, N. Y.

"WOLMANIZED*"... the most versatile pressure-treated lumber... because it's clean, nonoily, odorless, paintable... with service records to prove its durability.

KOPPERS COMPANY, INC.
Wolman Preservative Department
Pittsburgh 19, Pennsylvania
*Wolmanized is a registered trademark of Koppers Company, Inc.

Wolmanized
PRESSURE TREATED
Lumber
Stops Rot and Termites

Burying cables, Gradall digs the trench, backfills, removes and loads out excess fill. The "arm" and "wrist" action of boom and bucket enable the operator to do a hand-finish job.

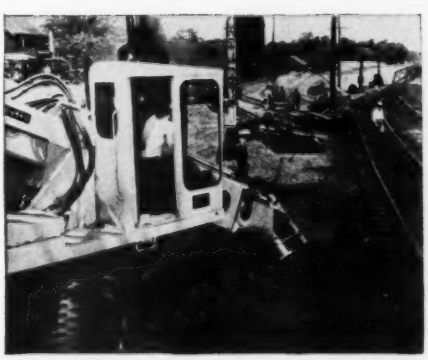
11 different jobs on track relocation ALL handled by ONE GRADALL!

On a million-dollar track relocation project, an eastern railroad's Gradall really demonstrated its money-saving versatility!

Gradall made it a "one-machine" job! The work involved building a double track over a fill to replace a single-track trestle over a swamp—plus "extra" jobs moving crossings, semaphores, etc. Trains can now maintain speeds of 45 mph through the area, eliminating the 15 mph bottleneck created by the trestle.

Look at this list of jobs—*all* handled by this one Gradall:

- Installing 800' of 24" culvert.
- Spreading ballast.
- Aligning track.
- Burying cables and removing excess fill.
- Installing semaphores—Gradall dug footer and placed signal in position after concrete was poured.
- Grading and building up roadbed.
- Loading out old ties.
- Building new crossing—clean-up preparation and spreading and rolling asphalt.
- Moving gateman's shanty to new location.
- Setting 78', 140 lb. rail.
- Dressing slopes.



Gradall clears the way for new roadbed. Note the new double-track line curving in from fill to meet old track, eliminating single-track trestle at top right.

In addition, this railroad has used Gradall for cleaning track (600' to 800' per day), replacing ballast, as an emergency unit, and for many other maintenance and construction jobs.

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RAILWAY

TRACK and STRUCTURES

Subject: **"Criticism Grapevine"**

Dear Readers:

Many people realize it is possible for them to get so close to their work that they are unable to see the results of their efforts from the vantage point of an overall perspective view. We recognize this to be true in our own case. We may try to achieve an impartial viewpoint in appraising the results of our own efforts, but we can't escape the feeling that we are not being entirely objective.

What I am getting at is that we, and I think almost everybody else, need outside help in evaluating the quality of their own work. There are various names for the kind of help I have in mind, but I can't think of a better term than "constructive criticism." The other kind—destructive criticism—is available free in unlimited quantities, but it is practically worthless because its underlying objective is to tear down rather than build up or help.

The kind of criticism that stems from a desire to be of help is extremely rare. This is the variety of criticism you might expect to receive from your friends, but we all realize how seldom it is that our friends are helpful in this respect. I suspect this is so primarily because people are afraid of getting an adverse reaction from the person criticized, in other words, that he may be hurt or offended. Ask a friend (not your boss) what he thinks of your work, and you can be pretty sure he will tell you that you are doing fine even though he may think otherwise.

We frequently wish that the situation were otherwise, and that our friends were more prone to tell us what they really think about the results of our efforts—and I am speaking of the magazine now—even if they have some faults they wish to bring to our attention. However, even if we can't change human nature there are ways of getting around it. If we are really in earnest about finding out what people think so that we may use the information in a constructive way to do a better job, we can use what I call the "criticism grapevine." Although your friends are not inclined to tell you directly what they think, they are apt now and then to let their guard down long enough to give a hint of their real thinking about your work in discussions with mutual friends or associates. If you have made it known in one way or another that you welcome constructive criticism you will soon find these comments trickling back to you.

This "secondhand" criticism has proved very helpful to us in our efforts to give you the kind of magazine you desire and need. From time to time we have made improvements in the magazine based on comments coming to us via the criticism grapevine. The individuals making the comment in the first place are not aware that we have made use of their thinking. We would like to tell them about it, but we don't want to spoil a source of constructive information.

The criticism grapevine isn't the best and most reliable way of obtaining suggestions for improvement. We would much prefer to have your constructive comments direct. In that way you will help us to produce a magazine of greater usefulness to all our readers. **M.H.D.**

THE RACOR "MJ" ADJUSTABLE VERTICAL SWITCH ROD

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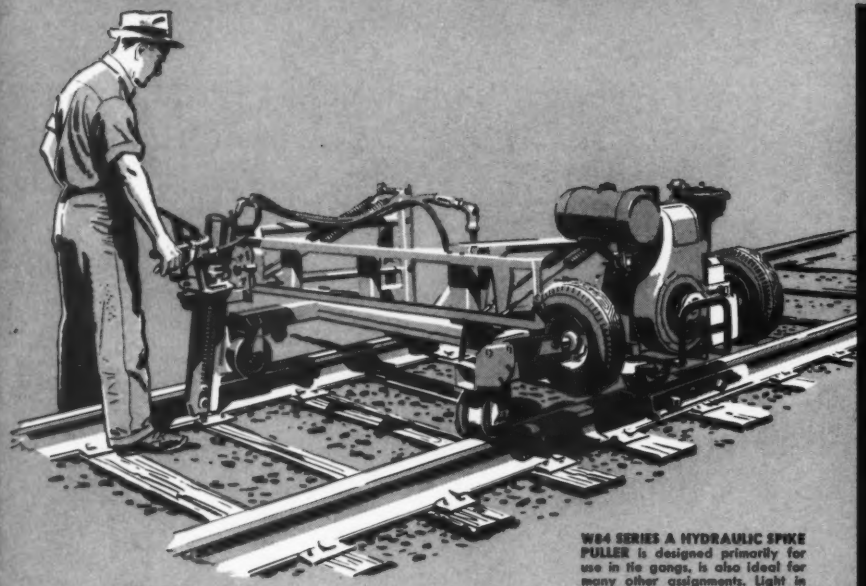

W84 SERIES A HYDRAULIC SPIKE PULLER is designed primarily for use in tie gangs, is also ideal for many other assignments. Light in weight, it features a dependable engine, ball and socket mounted pull assembly. Will pull spikes from either rail without change-over.

Is your problem tie renewal?

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Experienced railroad men have, through the years, come to know and rely on Fairmont products. They know from personal experience that they represent the very latest in design and engineering—and the very finest in performance and quality. And that is why—regardless of the maintenance problem at hand—Fairmont is looked upon as the logical source for maintenance equipment. In the field of tie renewal alone, Fairmont designs and manufactures a wide variety of products—each, in its area of operation, the perfect choice for dependability, economy and thoroughness of work. Like all Fairmont products, they are the result of years of careful design and engineering—and of actual field testing on the job. They have been proven through long use in the hands of maintenance men the world over—and have established themselves as the overwhelming choice of operating personnel everywhere. If tie renewal is your problem, we urge you to study the representative equipment pictured here and to contact us for complete, detailed information. You'll quickly discover why we say—"If there's a job to be done—there's a Fairmont to do it!"

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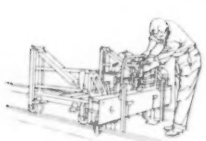
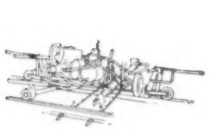
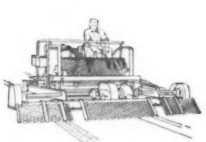


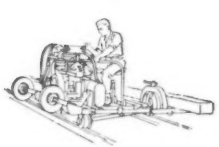
W86 SERIES A HYDRAULIC RAIL LIFTER makes tie plate removal and insertion unusually easy . . . with its spring - counter - balanced lifting arms, welded steel supporting frame and direct-driven hydraulic pump. Two-man track removal.



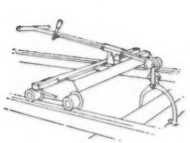
W68 SERIES A HYDRAULIC TIE REMOVER removes ties at a rate of approximately one per minute under average operating conditions. Ruggedly built, and with a minimum of moving parts, this unit requires only two men for operation.



W87 SERIES A TIE BED SCARIFIER with but one operator can dig ten feet of tie bed a minute to a uniform controlled depth and at right angles to the rails. The assembly is hydraulically operated, as is the drive for renewable digging teeth.



W90 SERIES A TIE INSERTER inserts ties quickly and easily and requires only two men for operation. Maintenance is remarkably low because of its simple design and sound construction. This unit is self-propelled for greater efficiency.



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RAILWAY TRACK and STRUCTURES

TRADEMARK

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FRED W. SMITH, Business Manager
R. E. DOVE, Associate Editor
ROBERT F. LINDSAY, Associate Editor

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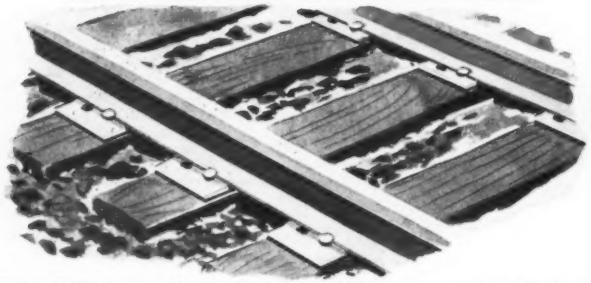

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Using the Research Tool

The value of research as a tool of progress in railway construction and maintenance is an accepted fact. Railroads everywhere are now reaping the benefits of past research, and unquestionably these benefits will grow as additional findings of the various research agencies are put to practical use.

The question now is whether railway maintenance and construction officers and supervisors are fully conversant with the research facilities available for solving their problems and with the procedure to be followed in making use of them. C. J. Code, assistant chief engineer—engineer of tests of the Pennsylvania, speaking before the annual meeting of the Roadmasters' Association at Chicago last month, made a number of worthwhile suggestions along this line. We think every track and B&B man should take note of them.

On those railroads having research laboratories there is probably a definite procedure to be followed in making requests for information, said Mr. Code. In such cases you should "find out what the setup is and put your request in through the proper channels and you will get your answer back much quicker. In fact, if you don't . . . you may not get your answer at all."

When asking for information from your laboratory "it is extremely important to give them a clear description of what your problem is," said Mr. Code, along with all the information needed by the researchers in tackling the problem. In cases where it is desired to obtain information from the AAR's Central Research Laboratory in Chicago, "you will probably find that requests for information should be cleared through your chief engineer."

The point is that, with facilities now available for conducting research into every phase of the railroad fixed plant, railway men in general, and maintenance officers in particular, have the responsibility not only of familiarizing themselves with these facilities but also of using them to maximum advantage.

3000 Questions

This month, your "What's the Answer" department is asking the 3000th question since its birth, a third of a century ago. Since its initial appearance in *Railway Maintenance Engineer*, parent of the present *Railway Track and Structures*, in January 1921, What's the Answer has been conducted as an open forum for the frank discussion of railroad engineering problems. The questions presented have covered a myriad of subjects ranging through the entire field of railway construction and maintenance.

More than 5000 answers to the questions have been published covering the experience of an army of maintenance men from section foremen to chief engineers. Many of the answers, because of their scope, have been expanded into feature articles which developed the basis for accepted approved practices.

New questions continually arise in these constantly changing times as new applications of men, machinery and methods are developed.

We who edit this department need the contributions, suggestions and help of everyone in the maintenance field as an aid in keeping the best in new ideas before you. For this reason, contributions in the form of questions as they arise in your daily work are always welcome as well as the benefit of your experience in answering questions posed by others. We merely act as the clearing house for the benefit of all in preparing your material.

It is not necessary that you be versed in the art of writing or the turning of polished phrases in order to make your contribution. We need your ideas. Your questions and answers may be in the rough; our job is to do the polishing. Together we can make the next 3000 questions equal or surpass the standard of the past.

R. P. Hart discussed the increasing responsibilities of supervisors today.

M. I. Dunn took a long-range view of the future of maintenance of way.

E. H. Hallmann drew a close relationship between public and employee relations.

Convention Report . . .

Roadmasters' and B&B Groups

Concurrent meetings at Chicago last month included two joint sessions at which addresses of mutual interest were heard. All of them emphasized the heavier responsibilities of the supervisors under today's conditions, in reducing costs, promoting public relations, and preparing for emergencies.

● Although this was a non-exhibit year, officers of the Roadmasters & Maintenance of Way Association and the American Railway Bridge & Building Association expressed satisfaction over the attendance at the concurrent annual conventions of the two groups, which were held at the Conrad Hilton Hotel, Chicago, on September 13-15.

For the most part the two associations held their meetings separately, but they came together in joint sessions on two occasions. One of these was the opening session on Monday morning, September 13, and the other was a joint afternoon on the following day. The activities of the individual sessions are dealt with in subsequent articles in this issue. This article deals only with the highlights of the two joint sessions. Sharing in the direction of these sessions were H. W. Kellogg, president of the Roadmasters' Association, and engineer of track, Chesapeake & Ohio, Detroit, Mich., and Lee Mayfield, president of the Bridge & Building Association, and resident engineer, Missouri Pacific Lines, Houston, Tex.

Both joint sessions were featured by interesting programs of addresses by top-ranking railroad officers.

Major addresses at the joint opening session were heard from R. P. Hart, chief operating officer, Missouri Pacific, who spoke on "Increasing Responsibility of Supervisors on Today's Railroads," and from E. H. Hallmann, director of personnel, Illinois Central, whose subject was "Public Relations Depend on Employee Relations."

At the second joint session there were also two principal speakers. One of these was M. I. Dunn, vice president, construction and maintenance, Chesapeake & Ohio, who spoke on "Immediate and Long Range Future of Maintenance of Way." The other was C. B. Fisher, general manager of the Chicago Union Station Company, who spoke in his capacity as operating officer, Northern Region, Railroad Section, Illinois Civil Defense Agency, and the subject of his address was "Effect of the H-Bomb on Track and Structures." His talk was illustrated by moving pictures.

In his address at the joint opening session, Mr. Hart left little doubt that railroad management expects its supervisory personnel to make even greater contributions to railroad progress than it has in the past. He referred to the improvements in methods and equipment that have made it possible to hold maintenance expenditures to nominal increases, while wages and material costs have been going up sharply. He added, however, that, "in the light of reduced income, keener competition and the abovementioned increased cost for labor and materials, you must now be more alert than ever before to discover and adopt refinements that will affect still greater economies in the maintenance of our railway facilities."

Mr. Hart urged his listeners to observe the operations of mechanical aids closely "to be sure you are getting full efficiency from them," to "personally study your equipment and become intimately acquainted with it" in order to get the best results from its operation, to keep work crews under close observation so that "you can tell whether each workman is consistently performing, hour after hour, a reasonable amount of effective work," and to give the foremen the kind of direction they need and desire.

Mr. Hart also sees a need for being "more cautious than ever about the selection of men" to be sure they are physically fit, for more careful planning in selecting the means to be used in getting men to and from work, and to use the best quality of materials and supplies available."

In his address on the public relations activities of supervisors Mr. Hallmann also placed heavy

C. P. Fisher pictured the role of M/W supervisors in an H-bomb attack.

CONGESTION around registration desk on opening day. A total of 752 railroad men and 405 supply men registered, or a grand total of 1,157 members and guests.

Hold Joint Sessions

G. W. Miller brought greetings from the AREA of which he is president.

responsibility on this group. Its employees are a railroad's greatest asset, he said, and then went on to make the point that it is the responsibility of the supervisors to make the most of this asset.

To do this, he said, we must accomplish three things: "First, we must be more selective in hiring new employees, second, we must do a thorough job of indoctrinating and training employees; and third, we must identify the better-than-average employees within the ranks and help them achieve what their abilities promise."

Mr. Hallmann said that it is no trouble at all to visualize the ideal employee, but unfortunately "it is much easier to visualize than to find them." Yet, he said, such people do exist and in far greater numbers than one might imagine. "We must give more attention to interviewing, testing and screening applicants for employment if we want to be certain of having personnel who are a credit to our industry. After hiring the right kind of people, our next responsibility is to help them get started in the right path."

Mr. Fisher gave a graphic account of the problems that will face the country as a whole and railway maintenance-of-way supervisors in particular, if we should be subjected to an H-bomb attack. H-bombs, he said, are 1000 times more powerful than the A-bombs used on Nagasaki and Hiroshima in Japan, and the area of blast is 10 times that of the smaller bomb. The total area of damage may exceed 1250 square miles. The responsibility for determining the extent of the damage to railroad facilities will be placed on the men responsible for the maintenance of tracks and structures. Then decisions must be made as to the areas which can be repaired quickly to return the important lines and facilities to service.

In his address Mr. Dunn expressed the opinion that "the railways will continue to dominate the freight transportation field during the foreseeable future," but that railway passenger train mileage" will no doubt continue to shrink." For this reason he expects that, as time goes on, "the roadmaster will be more concerned with the safe maintenance of track for high-speed freight trains because we cannot compete for the most desirable freight traffic unless we give fast, dependable and damage-free service." The accomplishment of this task will be facilitated by "three tried tools," namely, mechanization, gang maintenance and programming.

To develop the importance of the mechanization tool, Mr. Dunn presented figures to show that a "track laborer receives about the same wage today for two hours work as he did for eight hours in 1936." These accelerated wage increases, he said, are the primary reason for the development and adoption of the mechanization tool.

Turning to consideration of the gang-maintenance tool, Mr. Dunn described how the C&O, beginning about two years ago, took one division at a time "and commenced doing heavy track maintenance with a few large extra forces equipped with tools and enough men to do the work economically."

Speaking of the programming tool, he declared that a program has to be formulated and followed. He sees this kind of programming as being something new. "We are no longer firemen rushing from point to point just ahead of trouble. The millions of dollars that have been put into the railroads have, I hope, brought us to a point where, please heaven, we shall never have to go back to that situation."

Turn page for report on Roadmasters' sessions

Convention Report . . .

What the Roadmasters Did

They heard and discussed six reports of subjects committees and also brief reports from the three new standing committees. Three honorary members were elected.

President Kellogg at speakers' rostrum

● "It is the work of our association to help find new ways and exchange our ideas with each other. We can be justly proud of our records of increased efficiency we have achieved in our work through the use of the many fine power machines developed and put on the market by our friends, the manufacturers of maintenance-of-way equipment. These machines are built to save many man-hours of labor, and we are in direct charge of their operation and responsible for their efficiency and the safety of the men who operate them. It is our job to plan our work and progress our plans to a conclusion."

These remarks appeared in the address made by President H. W. Kellogg of the Roadmasters' Association before the first separate session of that group. Mr. Kellogg is engineer of track of the Chesapeake & Ohio at Detroit.

Immediately after President Kellogg's address those past presidents of the association, who were present were introduced. Next, three new honorary memberships were presented. These were conferred upon L. M. Denney, a past president of the association, who retired in 1944 as a track supervisor on the Big Four; John B. Kelly, also a past president of the association, who retired in 1952 as supervisor of safety on the Soo Line, having previously served that road for many years as general roadmaster; and W. P. Wiltsee, retired chief engineer of the Norfolk & Western, and another past president. These presentations were made by E. J. Brown, assistant chief engineer, Burlington Lines.

Following these preliminaries the association got down to the primary business at hand which was the presentation and discussion of the six reports that had been prepared by subjects committees. A new feature on the program this year consisted of the presentation of brief initial reports by the chairmen of the three new standing committees that have been established by the association. These are known as standing committees No. 1 (Machinery for Maintenance of Way Work), No. 2 (Track), and No. 3 (Roadway).

There was time on the program this year for only one major address. This was presented by C. J. Code, assistant chief engineer—engineer of tests, Pennsylvania, and dealt with the subject, "Laboratory and Other Tests to Aid in Solving Track Problems."

Abstracts of all of the committee reports and the address by Mr. Code, plus summarized versions of the discussions that followed their presentations, are given on the following pages. Brief reference is also made to the reports of the three new standing committees.

Election of Officers

In the election of officers R. G. Simmons, general roadmaster, Milwaukee, Chicago, was advanced from first vice-president to president; W. M. S. Dunn, general roadmaster, Nickel Plate, Bellevue, Ohio, was promoted from second vice-president to first vice-president; and J. E. Griffith, assistant chief engineer maintenance of way and structures, Southern, Knoxville, Tenn., was elected second vice-president. New directors are G. W. Neal, superintendent, Chattahoochee Valley, West Point, Ga., and D. C. Hastings, division engineer, Richmond, Fredericksburg & Potomac, Richmond, Va. E. E. Crowley, division engineer, Delaware & Hudson, Albany, N. Y., was re-elected treasurer.

Elected at the convention, the new officers of the Roadmasters' Association are:

R. G. Simmons
President

W. M. S. Dunn
1st Vice-president

J. E. Griffith
2nd Vice-president

E. E. Crowley
Treasurer

Roadmasters' Sessions—

A. P. Schmitt, estimating engineer; H. H. Elliott, division engineer; C. E. Elliott, engineer of track—all of the Western Pacific; W. B. Warfield, supervisor structures, PRR.

V. E. Yeargain, roadmaster, Frisco; C. A. Hagen, supervisor track, Illinois Central; J. B. Skidmore, roadmaster, Chicago, Rock Island & Pacific.

Highlights of Reports, Address, Discussions

● Abstracts of the six committee reports and the single address presented during the Roadmasters' sessions are given in the following, along with summarized versions of the discussions from the floor. Reference is also included to the reports of the three new standing committees.

SOLVING TRACK PROBLEMS

Some pertinent suggestions on how to initiate research work in the laboratory, along with helpful advice on how to carry out service tests, were contained in an address on "Laboratory and Other Tests to Aid in Solving Track Problems," presented by C. J. Code, assistant chief engineer—engineer of tests, Pennsylvania, Philadelphia.

Mr. Code started his talk by citing an example of an early experience he had with the laboratory on his railroad. His point was that quicker results would have been obtained if he had been familiar with the need for going through regular channels in requesting that the test be made. He suggested to his listeners that they find out what the setup is on their respective roads for obtaining information through the company's laboratory. "In fact," he said, "if you don't do it that way, you may not get your answer at all."

C. J. Code
Address—Laboratory and Other Tests to Aid in Solving Track Problems

For those who wish to obtain information from the Central Research Laborator of the Association of American Railroads in Chicago, Mr. Code suggested "you will probably find that requests for information should be cleared through your chief engineer." When seeking laboratory information "it is extremely important that you give them a clear description of what your problem is. If you want them to compare a new material, which is offered for a certain purpose, with the material you are already using, be sure to give them an accurate description of what you are already using, and if possible give them a standard specification for it, since the basis of these tests is comparison."

Mr. Code discussed a number of problems related to track work and bridge and building work on which the laboratory can be of material assistance. He said that his laboratory had been of the greatest assistance in "pinning down" the causes of certain types of rail failures. "Also," he said, "your laboratory might be of a good deal of assistance to you in checking up on defective tools. He is also sure that "your laboratory can give you a lot of help in determining which of the various kinds of ballast available along your railroad are most suitable for your use."

His company's laboratory, he said, has a test it runs on switch heaters. He feels this is the "best way to determine fuel consumption, to determine rail temperature, and to find out whether a heater is readily extinguished by a blast of wind."

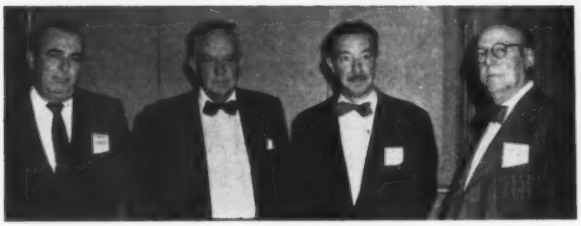
Mr. Code recognizes that many problems cannot be solved by laboratory tests and must be subjected to service tests. His recommendation is that such tests be organized by those who have had experience with them. "It has been my experience that when people set up service tests who have had little or no experience in running such tests, they usually leave out some important factors such as proper comparison with standard material, and in many cases this renders the test almost valueless."

TRACK WELDING

One of the committee reports, based on information obtained by a questionnaire sent to railroads all over the United States and Canada, dealt with the subject, "Welding in Connection With Maintenance of Track." Chairman of this committee was D. J. Bell, welding inspector, St. Louis-San Francisco, Springfield, Mo. The report was submitted "with the idea that there is a genuine saving in the maintenance man's money by following the procedures stated, in labor, material, time and better riding conditions."

The report pointed out that quite a number of railroads in the last few years have supplied their track welders with ¾-ton or 1-ton trucks, power drills, portable grinders, electric welding machines and house trailers. "This enables the welder to do more and better work, to be at emergencies quicker, to have the proper tools with him at all times, as well as not having to worry about trains with a motor car. Welders are doing a better

Roadmasters' Sessions—



J. A. Pollard, assistant engineer m/w, DL&W; L. T. Burwell, president, The Rails Company; W. J. Acker, eastern sales manager; R. W. J. Harris, salesman, Rail Joint Company.

R. M. Smith, district engineer, Missouri Pacific; E. L. Anderson, chief engineer, Frisco; W. H. Hobbs, chief engineer-system, Missouri Pacific.

class of work than they were several years ago at a great saving to the railroads in time and material."

The report went on to discuss the prevailing techiques for carrying out rail-end maintenance welding, for butt-welding rails, for making stock rails, for building up frogs in track by the oxyacetylene process and for repairing switch points.

"Arc-welding," said the committee, "is a comparatively new field on most of the roads and has been found to be very successful for almost all operations pertaining to track work." Three precautions to be observed in the use of arc-welding in building up manganese frogs or crossings were discussed, and the use of the skip welding technique was recommended. The committee stated that a frog or crossing built up in this manner should last as long as the original if given the proper attention after welding.

A detailed description was included in the report of a procedure for building up driver burns. It also described the procedure to be followed in building up open-hearth frogs and crossings. The committee stated that reports it had received indicated it was not practical to build up spring-rail frogs extensively in the track by the oxyacetylene process as the heat will warp them.

D. J. Bell
Chairman—Committee on Welding in Connection with Maintenance of Track

The committee said that it was common practice on some roads to cut rail with the cutting torch, and that this practice has been carried on for years without any known failures where the proper procedures were used.

DISCUSSION

J. E. Shaw (T&NO) touched off the discussion with a question concerning the proper use of the strap under rails to be butt-welded, which Chairman Bell explained.

A spirited exchange of ideas was started by a lengthy statement by S. E. Tracy (CB&Q) objecting to the recommendations of the committee with reference to the welding up of driver burns and the flame cutting of rail ends in main track. R. L. Fox (Sou) defended the report in a statement of the extent to which wheel burns were built up on his road. G. W. Bennett (NYC) supported Mr. Fox by recommending the welding of engine burns and the building up of rail ends by the oxy-acetylene method. O. H. Carpenter (UP) said his road had not as yet accepted the practice of building up wheel burns and that they did not weld up frogs and switch points under traffic. He further stated that 265 rails which had been damaged by driver burns had been removed on his territory. W. A. Schubert (StL-SF) said that he knew of no failures on his road which had resulted from the building up of driver burns. N. Halverson (GN), expressed his concurrence with Mr. Tracy's views. Mr. Carpenter wanted to know when and where to start building up burned rail. Mr. Fox replied that in his opinion ⅝ in should be the depth limit.

A. B. Chaney (MP) said that his road had not adopted the practice of building up driver burns because of the large area to be covered and the personal equation represented by the welder. He recommends the removal of multi-burned rail. He also asked for a comparison between rail which was butt-welded in the field and pressure-welded rail. Chairman Bell said that the consensus favored pressure welds.

SIZE OF GANGS

A committee reporting on the "Economical Size of Gangs for Track Maintenance," based its report on the premise that sharply higher hourly wages for labor are necessitating the greater use of machinery, and that in view of this situation, the section forces should perform little or no program work. This report was prepared by a committee of which G. D. Mayor, assistant division engineer, Chesapeake & Ohio, Russell, Ky., was chairman.

With respect to rail laying, the committee said that they consist of a gang designed for this purpose will be determined on the basis of whether or not the majority of the rail to be laid is on single or multiple track. On roads where the trackage is largely of two or more tracks it has been found that a system or district rail-laying force consisting of from 120 to 140 men, equipped with a full complement of machinery can lay rail at the lowest cost per lineal foot. On the other hand, the economical size of a rail-laying force for use in single-track territory may consist of from 35 to 60 men.

Turning to the matter of carrying out surfacing and tie-renewal work, the committee said that the development of the large, on-track tamping machine had brought about a complete change in methods and organization. The consensus of replies received by the committee led it to conclude that,

M. S. Westlund, exec. v-p, Electric Tamper & Equipment Co.; R. H. Beeder, asst. ch. engr., Santa Fe; G. W. Miler, engr., m/w, CPR.

R. J. Gammie, chief engineer, Texas & Pacific; G. H. Echols, chief engineer, Southern.

J. E. Eisemann, district engineer, GC&SF; J. W. Prewitt, regional sales manager, Electric Tamper & Equipment Company.

where diversion of traffic is possible, a 60-man force with full mechanical equipment can install ties, surface track and take care of lining and dressing, completing approximately 3600 ft of track per day. Where traffic cannot be diverted, a 30-man force seems to be the average.

However, because of the wide variation in the size of forces used for this purpose, it is obvious said the committee, that the economical size of tie and surfacing forces is one that must be decided by the maintenance officer on whose territory the work is to be performed. Only he can be familiar with his budget and the many variables involved.

Just as the whole picture of track maintenance has been changed with the advent of high labor costs and the resulting production of mechanized equipment, said the committee, so the picture may again change and change quickly. Certainly new and improved machinery will be forthcoming. Each such piece of equipment must, of necessity, require a re-examination of the organization handling it with a view to reducing costs and increasing production.

DISCUSSION

President Kellogg opened the discussion with the statement that there were as many ways of doing the work as there were railroads. R. L. Fox (Sou) said that his road was using section and division gangs equipped with trucks. The division gang, which was assigned without district, would be moved anywhere, thereby eliminating complaints as to authority in doubled-up gangs. M. McClendon (StL-SF), wanted to know who accepted the responsibility for the track under that setup. Mr. Fox replied that this was the responsibility of the assistant supervisor, who took the load off of the section foreman.

Two members asked what constituted the best inspection method and how territories were assigned? E. L. Anderson (SL-SF) said that on his road this was the responsibility of the district-gang foreman, and that he is privileged to assign the duty to an assistant foreman who patrols as instructed and directed by the foreman of the district gang. G. W. Bennett (NYC) stated that his road had temporarily eliminated track patrols and that section gangs were now patrolling once a week.

W. D. Almy (CRRofNJ) wanted to know how costs could be broken down per lineal foot, to reflect a good comparison of the various methods. G. D. Mayor (C&O) said his road was assigning an assistant cost engineer to each two supervisor's districts and that they determined costs for labor only and made no effort to consider material or machinery costs or depreciation.

G. B. McClellen (T&P) brought up the question of foreman eligibility and suggested getting rid of undesirable prospects before their 60-day probation period was up. President Kellogg said that on his road foremen were chosen from a promotion list.

HIGHWAY GRADE CROSSINGS

"The manner in which grade crossings are maintained provides the only yardstick by which many people may judge the efficiency of a railroad. Rough and poorly maintained crossings are a very poor advertisement. In addition to facilitating the flow of traffic, a well-maintained crossing serves as a good public relations medium."

This paragraph appeared in a report on the "Construction and Maintenance of Highway Grade Crossings." Chairman of this committee was H. F. Davenport, supervisor of track, Illinois Central, Corinth, Miss.

The committee then proceeded to discuss the properties of the various types of grade crossings in general use today. The types of crossings that are being installed at locations where the traffic over them is comparatively light consist of untreated plank, treated plank, monolithic concrete, rolled or cast metal, and the rail type. Crossings of precast concrete slabs of bituminous material and of prefabricated treated wood are being used generally on heavy-traffic crossings where the speeds of highway vehicles and trains are at a maximum.

In discussing construction methods, the committee said that good drainage is important in any type of crossing, and that any measure that can be taken to improve the drainage at a crossing will pay for itself by reducing maintenance.

The committee said that the practice of coating the rail in crossings with a petroleum product of some type is a good one, and that tie pads are coming into use in the construction of many crossings. It said that clean crushed stone or slag ballast makes an ideal foundation for any type crossing, and that when crossings are renewed, fouled ballast should be

H. F. Davenport

Chairman—Committee on Construction and Maintenance of Highway Grade Crossings

Roadmasters' Sessions—

J. O. Elliott, roadmaster; M. McClendon, roadmaster; V. E. Yeargain, roadmaster; D. J. Bell, welding inspector—all of the St. Louis-San Francisco.

L. C. Blanchard, roadmaster, CMStP&P; V. C. Hanna, chief engineer, Terminal Railroad Association of St. Louis; C. K. Luyster, district sales manager, Woodings-Verona Tool Works.

removed and replaced with new ballast to a depth of 10 in below the tie.

As crossings are renewed, any future change in the grade of the street or highway should be considered, and the crossing raised to the proposed grade. In general, new sawed ties should be used in all crossings. Extra time spent in picking ties of the same size and quality will be very worth while because it will add to the life of the crossing, stated the committee. Insulated joints should be located at as far as possible from the crossing.

The report emphasized the need for careful maintenance in prolonging the service life of crossings, and then discussed some of the things to look for or to do in this connection. When crossings are renewed the report said that many economies can be effected by programming crossing renewals to coincide with track surfacing and rail programs. Any programming work in this manner will eliminate tearing up the crossing several times.

DISCUSSION

L. C. Blanchard (CMStP&P) opened the discussion with a request for suggestions for the prevention of water pockets between the ends of street and sidewalk pavement in the track zone. Chairman Davenport suggested extension of the pavement across this area.

R. G. Schultz (T&NO), in reply to a question by R. L. Fox (Sou), said that his road had been unsuccessful in their use of precast concrete slabs and were now using a crossing constructed of cement-stabilized oyster shell with a bituminous seal coat. He said that this type of construction had eliminated heaving of the crossings and was successfully carrying city traffic of up to 5000 cars per day. G. M. O'Rourke (IC) called attention to a type of crossing construction used on his road which had a stiffener rail on the tie-ends outside of the running rail. This crossing did not heave in winter and was being successfully used in the Chicago area.

O. H. Carpenter (UP), said that he prefers the double flangeway with a 12-in plank on both sides of the rail and bituminous fill-in. This type of construction, he said, permitted inspection and servicing of the crossing rail. He further stated that this construction eliminated the problem of false-clear signal indications, which developed with a balled in flange rail. Another member said he prefers a double balled-in flange rail in place of an upright guard rail because of settling in the latter case.

J. E. Fanning (IC) wanted to know how prevalent head-web separations were in crossing rail. Mr. Fox replied that seven had occurred on his territory. Mr. Carpenter said that such separations were caused by the solid condition of the crossing and that his road tested its crossings with an Audigage, and emphasized the advantage of the double flangeway for inspection. A. B. Chaney (MP) concurred with Mr. Carpenter and said filled-in crossings should be dug out every 18 months for inspection. His road uses the ultrasonic car for head-web inspections. Mr. Schultz said they had had no trouble with head-web separations with the elastic shell-type crossing.

G. B. McClellan (T&P) stated that head-web separations were the result of gravel on the rail, while F. H. McKenney (CB&Q) said that the AAR holds that corrosion cracks cause this type of failure which grows progressively. He recommended coating the crossing rails with asphalt to prevent the start of these corrosion cracks which are particularly bad in crossings filled in with cinders, and in gravel crossings where dust and sand are prevalent. He further stated that, since using double timber flangeways, little trouble had been experienced with head-web separations in crossing rails.

OPERATING HIGHWAY VEHICLES

If the present trend of mechanizing all branches of the maintenance of way service continues, we should not be surprised to see the officers and supervisors lowering their helicopters adjacent to the track, bridge, pole line, manhole, or catenary, or wherever we may be working." This statement appeared in a committee report on "Rules and Regulations for Safe Operation of Highway Motor Vehicles." Chairman of this committee was L. A. Villella, safety inspector, PRR, Philadelphia.

The report included the results of a survey of accidents involving highway motor vehicles on one railroad during 1953, which showed that in all departments there were 207 accidents injuring 14 persons and killing two. The survey brought out the nature of the accidents and who was responsible for them.

L. A. Villella

Chairman—Committee on Rules and Regulations for Safe Operation of Highway Vehicles

O. W. Stephens, assistant to chief engineer-maintenance; E. E. Crowley, division engineer; B. W. Nyland, track supervisor; J. J. Conner, track supervisor—all of the D&H.

J. P. Morrissey, division engineer; R. D. Ricciardi, track supervisor; H. J. Weccheider, engineer maintenance of way—all of the Erie.

The solution of the problem of securing safe operation of highway motor vehicles is dependent upon preventive measures to eliminate avoidable accidents and the resulting suffering and loss of life and resources by expending efforts along three general lines:

(1) The driver, his qualifications, general attitude and respect for vehicle laws, safety rules, and vehicle maintenance instructions.

(2) Type and condition of the vehicles, equipped with safety devices to satisfy state laws, and the intended service.

(3) Suitable checks of actual driving operation to insure compliance with laws, rules and instructions, with appropriate remedial measures, when necessary.

The committee then offered numerous suggestions for conducting efforts along these lines, and concluded its report with this statement:

"Your committee feels that the adoption of the overall policy as indicated in this report—

(1) Suitable safety rules, specifications for types of vehicles to be furnished, and appropriate maintenance regulations.

(2) Proper selection and qualifying of drivers;

(3) Furnishing appropriate type of vehicle for service which it is to perform, and maintaining it in a safe condition;

(4) Suitable check of actual driving operations, i.e., enforcing vehicle laws and safety rules—will prove effective in bringing about a safe, efficient and uniform highway motor vehicle operation.

"These policies are appropriate whether the vehicle is company-owned or rented, or whether operated on or off company property."

V. C. Hanna
Chairman—Committee on Maintenance of Railroad Crossings at Grade

DISCUSSION

R. W. Putnam (SP) said that he was "frightened" by the hazards of motor-truck operation as brought out in the report. R. G. Simmons (CMStP&P) said that the Milwaukee Road had been lucky so far with respect to the number of truck mishaps. R. L. Fox (Sou) stated that the use of trucks on all M/W sections had not entirely eliminated mishaps. A motor car is carried in the truck to provide access to locations not served by highways.

A. H. Whisler (PRR) in reply to a question by G. M. O'Rourke (IC), said that his road was using nine highway-railway type trucks and that in the State of Pennsylvania they were required to deduct the weight of the flanging equipment from the pay load which, in the case of a 1½-ton truck, reduced the effective load carrying capacity to ¾ ton.

RAILROAD CROSSINGS

A committee reporting on "Maintenance of Railroad Crossings at Grade" was forced to the conclusion, after consideration of existing methods and practices, "that the subject of maintenance of railroad crossings at grade is indeed worthy of intensive thought and study by those of us directly responsible for the safe and economical maintenance of such crossings." Chairman of this committee was V. C. Hanna, chief engineer, Terminal Railroad Association of St. Louis. The report presented by the committee was a consolidation of current methods, practices, opinions and results, and "not necessarily a recommendation. . . ."

In discussing subgrade and drainage problems the committee said that the installation of mechanical drainage has been found to be most helpful, and that about ⅓ of the reporting railroads had used concrete slabs under certain crossings, most of them with satisfactory results. Pressure grouting has also been used by a large number of railroads with uniformly successful results.

The great majority of the roads reporting to the committee said that, in regard to the size and arrangement of ties and timbers, they conform to the recommended standard of the American Railway Engineering Association, although a number of variations used by several railroads were described.

The committee said that approximately 50 per cent of the reporting companies are using tie pads between the plates and the ties, but at this time their use is considered as still in the experimental stage.

The maintenance of joints within the crossing itself, as well as in the track adjacent to the crossings, is of utmost importance, said the committee. Insulated joints of good design and high quality should be specified and there is general use, almost without exception, of a canted abrasion plate on each tie under these joints.

The committee then discussed the problems encountered in maintaining proper alinement and gage through crossings, and pointed out that frequent and detailed inspection of crossings is considered of utmost importance by all who are concerned with crossing main-

H. K. Modery, assistant division engineer; J. P. Jones, assistant division engineer; J. A. McCabe, supervisor of track; P. L. Lewis, assistant supervisor of track—all of the Reading; W. D. Hoffman, vice-president, Railway Track-work Co.

tenance. In general, the section foreman inspects crossings on his section almost daily, while less frequent inspections are made by the division engineer or comparable officer.

The committee expressed the opinion that a high standard of maintenance of railroad crossings at grade is most important and highly desirable. "If each and every one of us, who is concerned with or has responsible jurisdiction over such maintenance, would consider each and every crossing as a personal challenge to our knowledge and ability, and then, by the exercise of our own ingenuity and reliance upon the experience of our contemporaries, improve the economical maintenance of this vital segment of the track structure, we will have rendered an outstanding service to our railroad, to the safety of its employees, and the comfort of the public it serves.

DISCUSSION

W. H. Ferryman (GN) suggested that the reported 2-in height of dressed ballast above the bottom of tie might result in the creation of a water pocket. W. M. S. Dunn (NYC&StL) stated that his road dressed ballast from 1 in to 1½ in above the bottom of the tie in the diamond and thought that this improved drainage. G. D. Mayor (C&O) agreed and said that, when the ballast is held low, it had been found easier on his road to clean up deposits of slack coal that had had accumulated in the crossing and impeded drainage.

R. W. Putnam (SP) stated it was his experience that ¼-in wide gage at crossings caused the rail to pull and resulted in rough riding. Chairman Hanna said that only one road had reported using ¼-in wide gage in crossings. J. P. Kleinkort (Ramapo Ajax), said that, while his company had not to his knowledge built any crossings to a wide-gage specification, such wide gage might permit the tightening of bolts to "pull in" the crossing as wear developed. F. N. Beighley (StL-SF) asked if wider gage would not require an increased width of flangeway. President Kellogg suggested that the flow of metal in the points of manganese frogs would tend to tighten gage under traffic. T. D. Hutcheson (Seaboard) stated that his road provided ⅛ in increased width of flangeways to compensate for wear in the upper parts of the filler blocks and that gage across the guard rails was standard.

J. E. Griffith (Sou) asked about the use of piles for the stabilization of roadbed under railroad crossings and suggested using concrete slabs supported by piles as a support for these crossings.

HANDLING BALLAST

One of the committee reports, dealing with the subject "Methods of Handling Ballast," represented an attempt "to reflect a comprehensive cross-sectional picture of methods and practices most acceptable." Chairman of this committee was J. E. Eisemann, district engineer, Gulf, Colorado & Santa Fe, Galveston, Tex.

While ballast cars are generally not assigned exclusively to the ballast trade, it would be highly beneficial if they were, said the committee. Use of the selective-type of car, which separately unloads each half of the car to either side of the track, or in the center, was recommended.

The economical maximum hauling distance for ballast was stated to be between 200 and 300 miles, providing no movement through a terminal is involved, while an ideal distance is 100 miles or less. When the supply source is within reasonable distance, very effective use has been made of dump trucks for ballast required at specific locations, or for purpose of secondary transport from regular ballast cars.

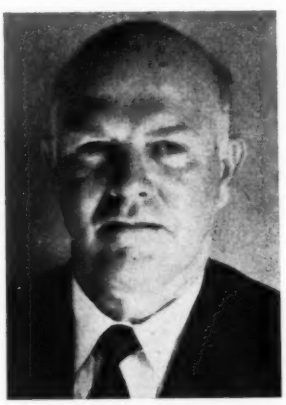
When it is necessary to handle ballast in freezing weather, and if the material is frozen in the cars, the most satisfactory manner of thawing would be through placing cars in heated buildings, according to the committee.

When using a work train, most efficient handling can be gained by placing no greater number of cars in the train than can easily be handled on any grade.

The need for safety in handling work trains was emphasized. Work trains are most economical when work is heavy, but where the accepted practice is not to use a work train for maintenance renewal, revenue trains suffice.

The various means that are used for distributing ballast while unloading were listed by the committee. Ballast needs at special locations, it said, are usually satisfied through ballast-door control. In some instances the practice is to unload adequate quantities at a central location, handling the material a second time to final locations. Insurance of equal distribution can best be obtained through use of an adequate force.

"In conclusion, your committee wishes to emphasize the point that the efficient distribution of ballast depends for the most part on the foreman in charge of the unloading work train. If he permits too much or too little material to be unloaded, the cost of handling ballast is appreciably increased because of the need for later redistribution. Also, the progress of the following raising and tamping units is adversely affected. In general, the exercising of good judgment by the unloading foreman and his ability to obtain the full coopera-



J. E. EISEMANN

Chairman—Committee on Methods of Handling Ballast

R. G. Simmons, general roadmaster, Chicago, Milwaukee, St. Paul & Pacific; H. W. Kellogg, engineer track, Chesapeake & Ohio; J. B. Templeton, president, Templeton, Kenly & Co.

W. A. Schubert, division engineer; V. R. Copp, special engineer; F. Jones, general foreman bridges and buildings—all of the Frisco.

tion of his men and the train crew make the difference in obtaining a good or bad job of ballast distribution."

DISCUSSION

Discussion of this report developed from a question raised by C. E. Neal (SP) in connection with the use of jacks as a device for controlling the flow of ballast when unloading from commercial hopper-type cars. Chairman Eisemann said that this method of unloading was practiced on two or three roads and called on S. H. Shepley (EJ&E), who described his road's method of adapting two trench jacks to control the opening of the hopper doors. Other methods of unloading with the use of pans attached to the car were described by another member.

Chairman Eisemann, at the request of T. M. Von Sprecken (Sou), explained the use of safety belts as a means of preventing the injury of men who were working inside of cars with open hopper doors.

W. M. S. Dunn (NYC&StL) asked for clarification of the part of the report dealing with the passing of signals to the engineer in connection with the movement of the train during the unloading process.

Another member stated that it was really the responsibility of the M/W forces to inspect ballast cars before loading to insure their tightness because this equipment was used in non-revenue service and the car department frequently slighted these inspections.

Objection to the statement with reference to the setting of ballast stakes to the base of rail was raised by G. B. McClellan (T&P). Chairman Eisemann explained that stakes so set could be made just as effective with the use of a block or other extension applied to the level board to compensate for the height of the rail.

New Standing Committees Make Their Initial Reports

Something new has been added to the activities of the Roadmasters' Association, namely, three standing committees which will continue in existence from year to year, and which will present reports annually. These committees are designated as follows: Committee No. 1 (Machinery for Maintenance of Way Work); Committee No. 2 (Track); and Committee No. 3 (Roadway). Chairman of the committees are: Committee No. 1—A. H. Whisler, assistant engineer, Pennsylvania, Philadelphia; Committee No. 2—D. C. Hastings, division engineer, Richmond, Fredericksburg & Potomac, Richmond, Va.; and Committee No. 3—R. H. Carpenter, engineer of design, Missouri Pacific, St. Louis.

During the convention each of the chairmen of the standing committees made a brief report on the work to date of his particular group. These reports are abstracted briefly as follows:

Committee No. 1 (Machinery for Maintenance of Way Work)—This committee, said Mr. Whisler, has been divided into five district committees, each of which is to cover one of five portions of the United States. Among the points made in this report were the fact that "there is no uniformity in procedures being followed by various railroads in their consideration of machinery for maintenance-of-way work; and that the railroads, "to secure the maximum benefits and economies from machinery used in the maintenance of our American railroads, must analyze the subject and compile information in accordance with the attached outline."

Committee No. 2 (Track)—Mr. Hastings, reporting for this committee, said that the committee had reviewed the proceedings of the Roadmasters Association for the last 11 years and had compiled a bibliography of subjects pertaining to the committee's work. In addition to this bibliography, the report of the committee contained a list of the various subjects that the committee feels come within its scope, as follows: Spring and split switches, frogs, crossing frogs, protection from brine drippings, hold-down devices, maintenance of joints, curve maintenance, surfacing track, installation and care of rail, gaging, continuous-welded rail, rail anchors, and track tools. Under each of these subjects was presented a bibliography of material on the topic found in the Roadmasters Proceedings and in publications of the AREA.

The committee plans during ensuing years to review each of these subjects and to present in its reports any new techniques, practices or methods that have been tried and proven.

Committee No. 3 (Roadway)—The report of this committee, said Mr. Carpenter, is designed to bring the association up to date on all assigned subjects, which are: Roadway drainage, roadway stabilization, chemical control of vegetation, highway crossings, roadway signs, ballast types and uses, and ties—maintenance, inspection and renewals. A brief report was presented under each of these subjects. In his remarks Mr. Carpenter made special reference to a method being used to clean compacted dust from the tracks following dust storms last spring in the western part of the country. In this method the material was first scarified by a homemade machine, after which the loose material was removed with a mechanized track broom with a belt conveyor attachment for disposing of the material well outside the ballast toe.

Turn page for report on Bridge & Building sessions

Convention Report . . .

What the B&B Men Did

President Mayfield directed the meeting

Eight comprehensive committee reports were presented and discussed. President Mayfield urges members to take part in association work and to help "sell" the railroads to the public.

● Are you interested in knowing what's new in tunnel maintenance? Or are you in need of information on the use of metal fasteners in wood construction? Or perhaps you need to bring yourself up to date on trends in the modernization of freight stations.

If so, you are much the wiser if you attended the Bridge & Building convention. Not only would you have heard comprehensive reports on these subjects, but also on five other subjects of current interest today.

These reports of subjects committees constituted the major item on the program of the B&B sessions, which were directed by Lee Mayfield, president of the association, and resident engineer, Missouri Pacific Lines, Houston, Texas.

So much time was taken up by the presentation and discussion of the committee reports, that only a brief period at the opening session was devoted to other matters. These included the opening remarks of President Mayfield.

In his address Mr. Mayfield said, "we should, at every opportunity, sell our railroads to our friends, acquaintances, and the public in general. You may say that we are supervisors and not traffic men, but every railroad man must be an active traffic man. Certainly, we know of someone who, at times, has a shipment of freight to make, or who is planning a trip; so why not prevail upon them to use rail facilities?

"Let us constantly inform them of the unfair competition to which the railroads are subjected; how they are hampered by bureaucratic speculation; and how their and our taxes are used to subsidize pampered competitors. This is a fight in which all of us must join in order that our railroads can maintain their rightful places in the transportation industry."

Abstracts of the committee reports, along with brief versions of the discussions, that followed their presentation are given on following pages.

Eight reports were presented at the meeting on: restoring flood damage; metal fasteners for wood construction; water facilities for diesels; tunnel maintenance; cleaning and painting of buildings; fireproofing bridges; modernizing freight stations; and, inspection, repair and replacement of culverts.

Election of Officers

In the election of officers, H. M. Harlow, assistant general supervisor, bridges and buildings, Chesapeake & Ohio, Richmond, Va., was advanced from first vice-president to president; J. A. Jorlett, assistant engineer bridges and buildings, Pennsylvania, New York, was promoted from second vice-president to first vice-president; R. R. Gunderson, bridge and structural engineer, Western Maryland, was moved up from third vice-president to second vice-president; W. H. Huffman, assistant engineer maintenance, Chicago & North Western, Chicago, was promoted from fourth vice-president to third vice-president; and M. H. Dick, editor, *Railway Track and Structures*, Chicago, was elected fourth vice-president. Directors elected were J. F. Warrenfells (re-elected) assistant division engineer, Seaboard Air Line, Raleigh, N. C.; H. D. Curie, master carpenter, Baltimore & Ohio, Garrett, Ind.; and J. M. Lowry, chief engineer, St. Louis Southwestern, Tyler, Tex. L. C. Winkelhaus, assistant structural engineer, C&NW, Chicago, was re-elected treasurer.

Elected at the convention, the new officers of the Bridge & Building Association are:

H. M. Harlow
President

J. A. Jorlett
1st Vice-president

R. R. Gunderson
2nd Vice-president

W. H. Huffman
3rd Vice-president

M. H. Dick
4th Vice-president

Bridge & Building Sessions—

D. H. Johns, asst. supv. of structures; H. M. Wilson, asst. supv. of structures; D. C. Todd, asst. engr.; C. H. Kooser, div. engr.; Fred D. Day, supv. of structures—all of the PRR.

R. R. Clegg, Koppers Company; J. A. Jorlett, assistant engineer bridges and buildings, Pennsylvania; W. H. Huffman, assistant engineer maintenance, Chicago & North Western.

Highlights of Committee Reports, Discussions

● The committee reports presented during the Bridge and Building sessions are abstracted in the following. Summaries of the discussions from the floor are also included.

WATER AND DIESELIZATION

To show how railroads are dealing with the problem of providing diesel servicing facilities without retiring those for steam was the objective of a report on "Adaptation of Water Service Facilities to Dieselization," of which R. H. Bush, water service supervisor, Texas & New Orleans, Ennis, Tex., was chairman. This committee first discussed the relative water requirements for diesel and steam locomotives. While the committee stated that it was not within the scope of the report to recommend a particular treatment for various water conditions found throughout the country, it is becoming increasingly evident that not enough attention has been paid to this problem.

R. H. Bush

Chairman—Committee on Adaptation of Water Service Facilities to Dieselization

Considerable attention was given to the matter of water delivery for diesel locomotives. All too often, said the committee, plans are made hastily, pipe lines are reduced in size and then extended in length, restricted valves and fittings are installed, and servicing hoses are either too small in diameter, too great in length, or of improper type. The committee urged that proper consideration be given the matter of friction losses when installing water-servicing facilities for diesel locomotives. In this connection, it stated the service valve can be the greatest offender, pointing out that spring-loaded types are to be avoided for this reason.

In a discussion of treatment for steam generator water the committee said that deionized water with finishing treatment is considered the ideal water for this purpose. However, because of economic considerations it is not always the most practical treatment. It was stated that zeolite will not consistently produce a trouble-free water in all instances, but that zeolite treatment has been found to be superior to soda-ash treatment for diesel service, and some roads having soda-ash plants are replacing them with zeolite plants.

The committee classified cooling water treatment as follows:

(1) Chromate, (2) non-chromate, and (3) organic, and discussed each of these types of treatment. It offered the following conclusions:

"Until steam locomotive water softeners have disappeared from service, it will be the responsibility of supervisors to make the best possible use of materials and equipment available in adapting them to diesel service. Water treatment for diesel service is under continuous study and results of these studies are made available from time to time. Supervisors should always be open minded and receptive to any improvements that may be suggested.

"Since it is necessary to provide water facilities for both diesel and steam locomotives until the latter have been retired from service, some installations for serving diesels will be more or less on a temporary basis, and, too, it is not definitely known, in some instances, where diesel facilities will finally be located. So, for these reasons, water service facilities for diesels may have to be installed at the most convenient locations for the time being.

DISCUSSION

E. R. Schlaf (IC), who sponsored this committee and presided during the discussion period, stated he believed that one of the most difficult problems for the water service men was that of reducing the friction loss in water-delivery lines to diesel power units. Friction can be substantially reduced at many locations, he added, by taking advantage of the larger water mains that were previously installed for steam service. In some instances, these old installations may be overlooked.

CLEANING AND PAINTING

"The best paint for any application is usually the one which will give optimum service for the longest period of time. Eventual failure is inevitable, but rapid deterioration is undesirable and can be prevented by careful observance of sound painting practice."

These statements appeared at the beginning of a report on "Cleaning and Painting of Railway

Bridge & Building Sessions—

H. H. Eggleston, supv. b&b (ret.), CGW; A. M. McFarlane, vice-president, Cullen-Friestedt Co.; E. J. Zapfe, assistant chief engineer, GB&W; P. DeLano, roadmaster—also GB&W.

J. W. Carter, bridge and building supevisor, Virginian; A. R. Ford, bridge and building supervisor, Great Northern; J. L. Skogreen, master carpenter, Chicago, Burlington & Quincy.

Buildings," prepared by a committee which was headed as chairman by W. L. Short, bridge inspector, Missouri Pacific, St. Louis, Mo.

Pointing out that no "magic paint" exists that eliminates necessity for clean surfaces when applying the coating, the committee discussed the various cleaning methods and their particular fields of use. The methods discussed here included solvent, alkaline, steam, and acid cleaning, paint and varnish removers, hand cleaning, power cleaning tools, blast cleaning and paint burning.

Paints should be selected on the basis of their compatability with the surface to be protected and their resistance to the particular environment. The committee pointed out that paints consist of pigment and vehicle and described the character and function of each of these ingredients. It then told how various types of surfaces are prepared for painting, including exterior wood surfaces, interior wood surfaces, ferrous and non-ferrous metal surfaces, concrete, masonry and plaster surfaces.

Quality paint supplied by the manufacturer for a specific use is usually ready for application by brush or by spray as specified; it should be used without any unintelligent modification, said the committee. It is very important that most paints be applied to dry surfaces and that the film does not freeze or be exposed to rain or frost before drying.

DISCUSSION

J. F. Warrenfells (SAL), who sponsored this committee, presided during the discussion period.

W. F. Huffman (C&NW) wondered if the report were not too technical to be generally understood by those present, and Chairman Short replied that a report on this subject must necessarily treat the technical aspects.

In answer to a question about where a good paint for use on steel structures in brine territory could be procured, Chairman Short said that the research staff of the AREA had made many tests on various coatings and would be able to recommend a satisfactory one. R. C. Baker (C&EI) told of the work being done by the Steel Structures Painting Council.

Chairman Short concluded that he was of the opinion that much could be done to improve painting practices on the railroads, and that what is generally known as the "safety factor" in design is now being termed "ignorance factor."

MODERNIZING FREIGHT STATIONS

In the modernization of freighthouses there are a number of trends that seem to be general throughout the country, and these were covered in detail in a report on "Trends in Modernization of Freight Stations." This report was prepared by a committee which was headed as chairman by R. C. Baker, engineer of structures, Chicago & Eastern Illinois, Danville, Ill.

The matter of changes in the exteriors of freight stations was disposed of rather briefly by the committee, which mentioned various means of repairing or improving the exterior appearance. Door openings may be changed to accommodate present-day trucks and trailers, and the need for replacing old-style sliding or hinged type doors with modern overhead doors was mentioned.

With reference to freight-station interiors, the committee noted that wearing surfaces must be designed to carry present-day wheel loads of mechanical equipment now in use, that continuous overhead or underfloor towing systems are available for use in restricted locations or where the volume of business is large, that a service shop, adequately equipped, should be provided for repair and maintenance of mechanical equipment, that welfare facilities should be placed at suitable locations for employees, and that adaquate lighting and communication facilities should be provided.

Several instances of the use of tilt-up construction in freighthouses

W. L. Short

Chairman—Committee on Cleaning and Painting of Railroad Buildings

R. C. Baker

Chairman—Committee on Trends in Modernization of Freight Stations

W. H. Ferryman, division roadmaster, Great Northern; R. R. Manion, chief engineer, Great Northern; H. D. Curie, master carpenter, Baltimore & Ohio.

P. R. Ciccolilli, supervisor bridges and buildings, Central of New Jersey; R. A. Eitel, assistant supervisor structures, Pennsylvania; F. Rapant, junior engineer structures—also Pennsylvania.

were described by the committee. Brief descriptions were also included of several large-scale freighthouses constructed in recent years, including one on the Santa Fe at Chicago, one on the Missouri Pacific at St. Louis, and one on the Burlington at Chicago.

DISCUSSION

Chairman Baker presided during the discussion period.

W. B. Warfield (PRR) commented on the use of steel trusses for freight stations and recalled an instance where the lading within the house got on fire and overheated the steel trusses which collapsed, bringing down the walls with them and creating a worse condition for extinguishing the fire. Chairman Baker was of the opinion that, when the fire was that intense, the walls and trusses of timber construction would create a similar condition.

T. E. Jackson (SP) said that when old stations are being modernized, he has replaced the wood platforms with precast concrete slabs, supported by rails spanning concrete pedestals.

J. S. Hancock (DT&I) said that an overhead door, 22 ft wide, sounded like a fine thing but, when opened during winter for taking in lading, the cold air rushed in and rapidly cooled the interior. He thought that sliding doors were preferable. Chairman Baker stated that his road does not heat freighthouse interiors and the doors are opened in the morning and stay open until the house is closed at night. Also, he said, sliding doors must have a housing of some kind to prevent lading from jamming them.

When W. H. Bunge (MP) inquired about the economy of using tilt-up wall construction, W. C. Oest (FW&D) said that it effected a saving of about 12 per cent over conventional construction.

RESTORING FLOOD DAMAGE

The necessity for compiling complete and accurate records on previous floods and the damage caused by them constituted a point made by a committee reporting on "Organization for Restoration of Flood Damage," of which E. L. Collette, division engineer, Frisco, Ft. Smith, Ark., was chairman. "Some of the data to be recorded," said the committee, "include dates of flood; intensity, duration, and amounts of rainfall; high water crests; velocity of flows; quantity passing through drainage structures; character of runoffs from the watersheds traversed by the road; soil erosion; likelihood of floating debris to be cleared at structure openings or to be carried by currents."

The committee also emphasized the need for keeping proper records of railroad labor forces as assurance that they will be mobilized quickly. Records of the forces available through outside organizations, such as other railroads, highway or municipal construction or maintenance forces, contractors, labor procurement agencies, etc., should also be kept.

Power tools and equipment play an important part in dealing with emergencies, according to the committee. "When planning for emergencies," it said, "railroads recognize they will be forced to buy tools and equipment they might not have been able to justify for normal working operations." Information regarding sources of supply of such equipment and the transportation of the items should be included in the plan of procedure. Large pieces of equipment, both off and on track, which are in use on nearby railroads should be included in the records.

The stockpiling of materials needed for restoration purposes "requires intelligent planning, constant watchfulness, and skillful supervision if losses are to be minimized." Railroads which do not use much trestle material will find supplies at treating plants at new and used timber dealers, and at some heavy construction companies. When materials are stored, adequate and proper fasteners must also be stored where they will be readily available.

Provisions for feeding and housing labor must be included in any plan for dealing with emergencies, said the committee. The need for housing may range from temporary shelters for weather protection to the use on a large scale of camp cars and related facilities. When housing large numbers of men in cars or other units is necessary, personnel familiar with the operation of a labor camps or large camp train forces, should be placed in charge of a unit. Charts should be posted in all camp train units listing the equipment required according to the number of men to be bedded and fed.

The supervisory personnel assigned to the emergency task force should be reviewed frequently. Physical capabilities of men change rapidly, according to the com-

E. L. Collette

Chairman—Committee on Organizing for Restoration of Flood Damage

W. A. Buckmaster, assistant division engineer, Baltimore & Ohio; C. H. Mottier, vice-president and chief engineer, Illinois Central; T. M. Von Sprecken, assistant to chief engineer, Southern.

A. H. Whisler, assistant engineer, Pennsylvania; R. G. Angell, railroad sales manager, A. M. Byers Co.

mittee, and their compatibility for high pressure work might affect the progress of the work and the health of the man himself. "The success of any restoration plan will be assured if competent, vigorous and sharp organizing maintenance and construction men, thoroughly familiar with the plan, are put on the team."

Summing up its report, the committee said that, in his participation in the restoration of railroad facilities after flood damage, the bridge and building man should:

(1) Have a plan for restoration of flood damage and follow it, consistent with good practice and the requirements of the restoration.

(2) Have competent and able supervision to carry out orders.

(3) Cooperate with all departments in the prosecution of the work.

(4) Use all reasonable means to keep the personnel on the job contented and interested in the progress of the work to the end that it will be done efficiently.

(5) Have a reasonable knowledge of the cost of the restoration when the work is started and keep a current record of the cost as the work is being done.

DISCUSSION

J. A. Jorlett (PRR), who sponsored this committee, presided during the discussion period.

W. B. Warfield (PRR) remarked that, for keeping the cost of a disaster to a minimum, the number of hours that the men are worked continually should be watched closely to avoid high overtime charges. This applies also to men called from other divisions. He also pointed out that the matter of feeding the men at proper times is important in keeping them contented.

H. O. Adkins (D&RGW) stated that he depended a great deal on being able to procure the necessary work equipment from nearby local contractors on a rental basis, which cost just about the same as when using railroad equipment.

President Mayfield said that adequate rest periods for the men should be provided. Also, he said, from knowledge gained from railroad profiles, he could determine just where the water would first recede and plan his work accordingly.

FIREPROOFING BRIDGES

"The history of our carriers reveals that destructive fires to timber structures have annually taken a heavy toll both in the expense of reconstruction as well as in loss of revenue due to traffic interruptions." So stated the Committee on "Fireproofing of Timber Bridges," which was headed as chairman by C. E. Elliott, division engineer, Western Pacific, Sacramento, Calif.

In order to reduce or eliminate fire damage with resulting hazard of operation, many railroads have undertaken studies and tests to develop methods of fireproofiing timber structures. The problem of fireproofiing timber structures involves the seeking of a composition having sufficient insulating power to maintain timber temperatures below ignition point of both the timber and the preservative material.

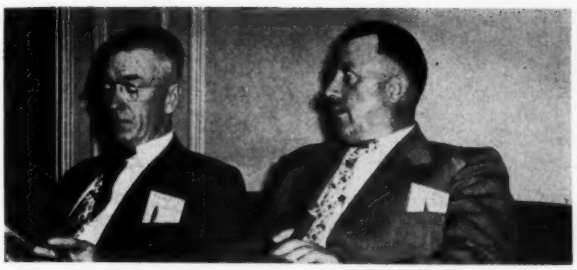
Bituminous-based coatings comprise the greater portion of fire-retardant materials that have satisfactorily passed the tests and have been placed in practical use by many railroads, according to the committee. The addition of gravel screenings applied to the protective coating of deck timbers adds to the effectiveness of the retardants, but the use of such gravel coatings on vertical timbers and piling is not recommended because the increased weight causes the fire-retardant material to flow more rapidly under intense heat. Practical tests have demonstrated that bituminous coatings require the application of a layer of glass fabric to affect proper bonding on vertical surfaces, said the committee.

A considerable portion of the committee's report was devoted to a discussion of the types of weeds and grasses that grow under and around bridges, and the means available for controlling them. During the last 10 years, said the committee, chemicals have come into the picture and they are being used by railroads in increasing quantities for the elimination of grass, weeds and brush under and around bridges.

The committee then got back to a discussion of the use of fire-retardant materials, stating that by far the greater portion of protective work undertaken so far by the various carriers involves the application of fire-retardants to timber ties on steel structures and to the deck timbers of open-deck structures. The retardant materials selected for use should have sufficient durability to be effective under all conditions of weather and service for a period of from seven

C. E. Elliott

Chairman—Committee on Fireproofing of Timber Bridges.



C. M. Richardson, roadmaster; G. H. Johnson, general foreman bridges and buildings and water service—both Atcheson, Topeka & Santa Fe.

C. Wingerson, railway sales engineer, Oliver Iron & Steel Corp.; J. F. Warrenfells, principal assistant division engineer, Seaboard Air Line.

to ten years, said the committee. It went on to say that results of applications of fire-retardant coatings to timber decked bridges have been highly gratifying to bridge maintenance supervisors.

It pointed out, however, that experiments now being made to develop the application of fire-retardant materials to timbers in conjunction with the preservative treatment may eventually prove successful to an extent that a considerable portion of field application of the retardant will be eliminated.

DISCUSSION

R. R. Gunderson (WM), who sponsored this committee, presided during the discussion period.

E. J. Ruble (AAR) stated that there is no known fire-retardant coating which will protect the undersides of timber structures. Glass fabric will afford this protection, he said, but it is expensive.

A member questioned the economy of fireproofing timber bridges as he didn't think that the cost of replacing the few bridges that did burn out would justify the cost of fireproofing them. Mr. Ruble said that these costs will be brought down; he added, however, that a southern railroad which had 2800 ft of trestle burn out over Lake Pontchartrain would have been very happy to have previously spent the money to make it fireproof.

T. M. Von Sprecken (Sou) said he is considering the installation of fire-warning signals for trestles at isolated points and asked for information in this regard. E. H. Haase (SP) said that several hundred bridges on his road have this protection, which consists of fusible links connected to the signal system. In the event of a fire, the fuses melt and cause the signals to display the "stop" indication.

Referring to the fire tests made on the Santa Fe on coatings applied to timber structures, a member wondered why tests were not conducted with fire-retardant treatments. Mr. Ruble said that, while fire-retardants are used for timber treatment, the tests were made with coatings to find something that would protect the many structures already in service.

C. G. Green (B&O) asked about the effectiveness of maintaining water barrels at timber structures, and H. A. Matthews (SL-SF) replied that he believed them to be useless because hunters shoot them full of holes.

Shirley White

Chairman—Committee on Tunnel Maintenance

TUNNEL MAINTENANCE

Comprehensive information on tunnel maintenance was given in a report on that subject made by a committee of which Shirley White was chairman. Mr. White is general bridge and building supervisor of the Southern Pacific at San Francisco, Calif.

The committee first discussed the methods and equipment used in scaling unlined tunnels driven in rock. Next, it took up the subject of timber-lined tunnels, discussing the size of timbers used for this purpose, the service life of timber linings, methods of reinforcing the lining when failure occurs, and the procedure to be followed when renewing timber sets.

A method for prolonging the life of tunnel timbers by replacing timber footings with continuous concrete footings was described, and fire protection in timber-lined tunnels was discussed.

Several examples of the installations of steel linings in tunnels were described; other examples told how concrete was used for rehabilitating tunnel linings; and still others described how concrete-lined tunnels were repaired by grouting.

Methods of relining tunnels were described, including the replacing of a concrete lining, and the placing of concrete ribs between timber sets. Also described were several methods used for placing concrete in tunnel forms.

The committee submitted the following recommendations:

(1) As new work is done or major repairs are made on tunnels, they be enlarged to a standard clearance.

(2) As a means of prolonging the life of existing timber-lined tunnels, the wood footings under timber sets be replaced with continuous concrete footings before failure of wood footings results in distortion of timbers and consequent failure or breakage.

(3) As major repairs become necessary and a study has first been made to show that opening up or daylighting is not feasible under existing conditions, consideration should be given to lining timber-lined tunnels and unlined tunnels with concrete, steel or other permanent lining. In view of the greatly increased labor and material costs of maintaining and repairing timber-lined tunnels, this would be one of the most progressive measures that could be taken to prolong the life of tunnels. The

Bridge & Building Sessions—

R. C. Baker, engineer structures, Chicago & Eastern Illinois; H. E. Jackson, master carpenter, Baltimore & Ohio.

A. C. Price, bridge and building master; John Fox, bridge and building master—both Canadian Pacific.

additional cost of installation of any of the permanent materials is offset by the reduction in maintenance cost over a period of time and elimination of the ever-present fire hazard in timber-lined tunnels.

(4) Due consideration should be given to preventing seepage of moisture through concrete and brick-lined tunnels by grouting cracks and providing openings through which drainage can flow without saturating local areas of the lining which contribute to icing conditions and deterioration.

DISCUSSION

G. Switzer (WP), who sponsored this committee, presided during the discussion period.

T. E. Jackson (SP) said that a record was kept of the cost of lining a tunnel by the shotcrete method where traffic was diverted for three hours each day to one track. The work was slow in the beginning and the cost was $50 a tunnel-foot because the lining was made out of face and it required time for the concrete to dry and set. When they changed their method by first building ribs throughout the length of the tunnel and then going back and filling in between the ribs, the cost went down to $9 a tunnel foot.

G. W. Benson

Chairman—Committee on Metal Fasteners in Bridge Construction

J. W. N. Mays (PRR) stated that it is a mistake to line a tunnel having seepage without first getting rid of the water at its source as it only results in a poor job. H. O. Adkins (D&RGW) stated that he does not try to seal seepage cracks as he found the water only finds another entry into the tunnel. He inserts a rubber downspout where seepage occurs, which carries the water to the side drains.

Mr. Switzer inquired about the use of anchor bolts in tunnels and W. B. Warfield (PRR) said that they are useful where rock seams prevail and obviate the need to knock the rock down to prevent a later rock fall.

METAL FASTENERS

"We now have machine production of many types of metal fasteners available at reasonable costs, and their use tends to supplement the restricted supply of structural timbers." This statement appeared in the report of the committee reporting on "Metal Fasteners in Wood Construction," which was headed as chairman by G. W. Benson, superintendent of bridges, Central of Georgia, Macon, Ga.

The committee said that there are two noticeable trends in the use of hardware: (1) Galvanized fastenings are gaining in preference over black iron; and (2) there is a preference for single-piece fasteners such as drive spikes and lag screws with head and washer forged of one piece. Each type of connector has certain advantages for its particular use, both in convenience and cost.

In discussing the use of devices for fastening bridge ties to steel stringers or girders, the committee said that one road uses a special lug with machine bolts and washer nuts, and that spring clips have been used with one end of the clip resting on the bottom of the flange and the other on a tie. The most widely used device in this connection, according to the committee, is one having a hook on the bottom end designed to develop full strength of the bolt without bending, with four fins to prevent the bolt turning when forced into the tie and with washer nut with nail hole providing a simple means for preventing the nut from loosening.

The committee said that installations of clamping plates between the ties and guard rail have been reported. It explained that clamping plates are steel fasteners which are seated between ties and guard timbers.

It also stated that the use of timber connectors is increasing, both in construction and maintenance of trestles. Many installations of single-curve spike grids between braces and piles, and clamping plates between braces and caps, or square posts and caps, are reported. Flat grids can be used in place of clamping plates.

In trestle construction the most interesting development, said the committee, has been the use of the stay rod for fastening the deck to the cap. A recent development has been the use of lags on each side of the cap instead of a through bolt. These are used in both butt-joint and lap-chord construction and eliminate a vertical hole through the stringers.

Timber connectors provide a much-needed accessory for large clear-span timber trusses used in warehouses, shops, freighthouses, car-repair sheds, transfer platforms and other structures. Probably the most widely used of all timber connectors are split rings which are placed in pre-cut grooves in the adjacent faces of adjoining structural members. Toothed rings are used in the same way as split rings

T. C. Reed, bridge and building supervisor, Louisville & Nashville; E. E. Cash, supervisor maintenance, Camus Prairie.

A. J. Mulvihill, sales engineer, F. Burkart Manufacturing Co.; G. M. O'Rourke, assistant engineer m/w, Illinois Central.

except that they are forced into the faces of adjacent members and hence are not suitable for prefabrication.

Shear plates are placed in precut grooves as are split rings but they are completely imbedded in one member so that they are flush with the face of the timber. Framing anchors which eliminate the uncertainty of toe nailing have recently been introduced.

DISCUSSION

W. H. Bunge (MP), who sponsored this committee and presided during the discussion period, commented on his surprise at the small percentage of coated hardware that the report showed as being used by railroads in brine-drippings territory. A. R. Harris (C&NW) said that he tried an experiment by using galvanized hardware on one side of a bridge deck and uncoated on the other. After 13 years of service, he said, the galvanized hardware was still in good condition and the uncoated had rusted away.

C. Elliott (CofNJ) stated that at places where he had noticed common nails working out of planks from traffic vibrations, he had substituted drive spikes. Mr. Harris said that, where lag screws loosened under traffic, he used drive spikes instead.

REPAIR OF CULVERTS

Practices followed in the inspection, repair and replacement of culverts were reported by a committee which was headed as chairman by M. D. Carothers, assistant chief engineer, Gulf, Mobile & Ohio, Bloomington, Ill.

Regarding the matter of inspection, the committee said that it is the general practice to have a minimum of two inspections of culverts per year, one being made by designated division officers, and the other by a general bridge inspector usually assisted by a qualified B&B carpenter who is familiar with the local condition. The division inspection is usually made in the spring of the year in most territories in order to be ahead of vegetation, while the general office inspection is normally made in the fall.

Things to look for when making inspections were outlined by the report. The various items were discussed for the different types of culverts, including stone-box culverts or stone*arches*, wood-box culverts, rigid sectional pipe culverts, flexible pipe and concrete culverts.

Under these same classifications, the committee discussed the manner and method of making repairs to the different types of culverts. It then went into the matter of replacement, pointing out that replacement rather than repair of culverts is nothing more than economics. If replacement can be provided as cheaply as making repairs, and the replacement would give as long as or longer useful service life, there should not be much question as to the procedure to be followed. However, the committee recommended that a careful investigation be made of the requirements before any culvert is replaced. If sufficient cross-sectional area can be obtained by installation of a corrugated pipe within the existing culvert it was recommended that this practice be followed as it is usually the most economical.

Use of the jacking method for inserting culverts was discussed, and the procedure to be followed in using this method was described. The committee also described how old stone arch and concrete structures may be relined with corrugated metal.

DISCUSSION

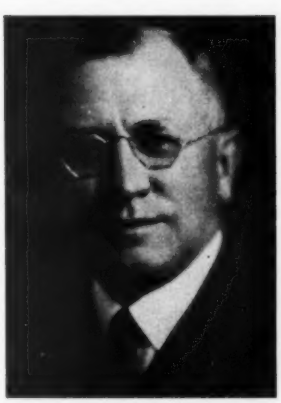
W. H. Huffman (C&NW), who was the sponsor of this report, presided during the discussion period.

H. O. Adkins (D&RGW) remarked that he preferred to tunnel with liner plates, when installing a culvert in a long fill, rather than jack pipe sections through because the pipe often gets stuck when jacking.

V. D. Rasessler (IC) questioned the use of inside expansion bands that were mentioned in the report for repairing joints that had pulled apart. Mr. Huffman reported that the bands worked very well with cast-iron and concrete pipes and they eliminated a great deal of the more expensive jacking. H. D. Curie (B&O) stated that he had also found this to be true.

E. E. Cash (Camus Prairie) stated that, after jacking opened joints together again, he had used iron bands recovered from dismantled water tanks to tie them together.

W. H. Pryor (SL-SF) thought that opened joints should be jacked together rather than use the bands, but F. T. Teske (Soo Line) stated that his road used the bands with good results. The bands were made in the railroad shops and were so designed that they would fit oval or round pipes and would bolt to the pipe sections.



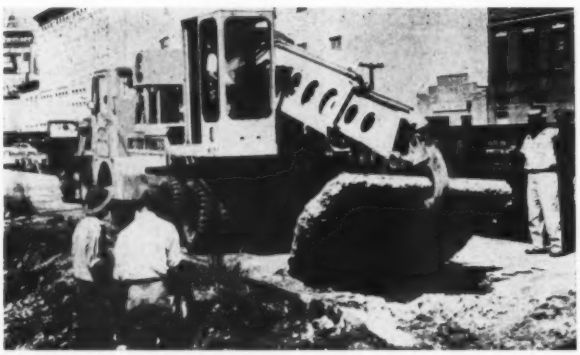
M. D. Carothers

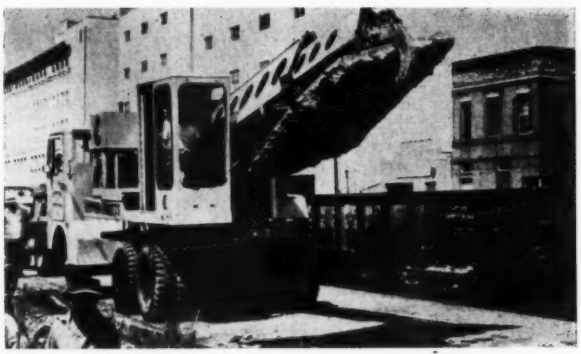
Chairman—Committee on Inspection, Repairs and Replacement of Culverts

RADNOR YARD, $15-million joint facility of the Louisville & Nashville and the Nashville, Chattanooga & St. Louis at Nashville, Tenn., was officialy opened with dedication ceremonies September 22. The new installation consists of three separate yards in a 1-2-3 sequence of receiving, classification and departure which is over five miles long from end to end. Aerial view above shows 3,275-car hump-retarder classification yard in center with portion of 1,780-car receiving yard in foreground and part of 2,344-car departure yard in far distance. At right is portion of old yard which was retained for use as mechanical servicing and storage yard. At maximum capacity Radnor will reportedly handle 3,000 cars per day.

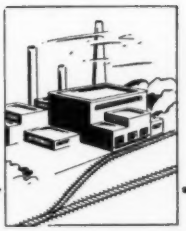
News Briefs in Pictures . . .

SEMI-ANNUAL meeting of the Associated Railway Track Contractors of America, Inc., was held September 13 at the Conrad Hilton Hotel in Chicago.



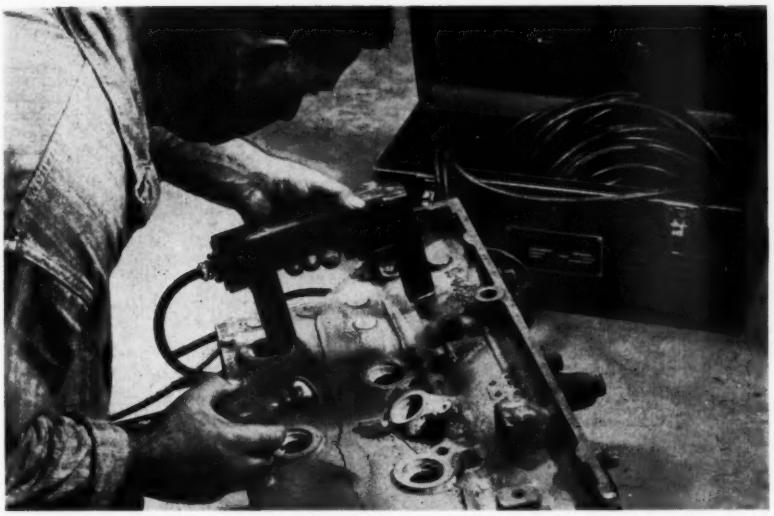


GRADALL was used recently to tear up and load large slabs of concrete at the Southern Pacific station in New Orleans. At left a single-tooth ripper attachment is employed to pry up slab, after which slab is picked up (right) by closing the ripper in a wrist-like fashion so as to hold the slab tightly against the boom.



PRODUCTS OF MANUFACTURERS . . .

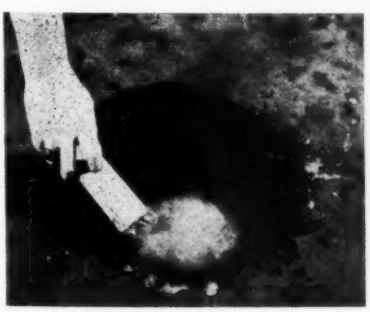
. . . new, improved equipment, materials, devices



MAGNETIC TESTING KIT

A MAGNETIC particle inspection kit, designed especially for preventive maintenance inspection, for weld inspection and for limited volume inspection of any magnetic parts wherever surface cracks are suspected, has been announced by the Magnaflux Corporation, Chicago. Known as the Magnaflux Y-5 yoke kit, the device comes in a metal carrying case, about the size of a fishing box, and weighs less than 30 lb complete. Included in the kit are Magnaflux powder, powder bulbs, and operating instructions for testing with the 7-lb yoke which is equipped with a 100-ft cord. The unit operates from a 110-volt ac line and draws 6 amps.

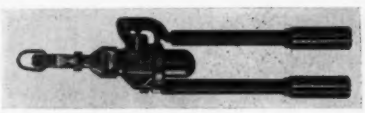
The machine is designed for use by one man who handles the yoke with one hand, while with the other he dusts on the Magnaflux powder. The yoke will test up to about 24 sq in of area at each application.



PREPARES CONCRETE FOR REFINISHING

A NEW LIQUID etching product, specially developed for preparing concrete and cement floors and masonry surfaces for sealing and refinishing, has been announced by the Rust-Oleum Corporation, Evanston, Ill. The new product, known as Surfa-Etch, cleans, etches and neutralizes concrete or cement surfaces in one application by cleaning the pores so that they are free from oils, greases, dirt and accumulated soap film.

Surfa-Etch is applied liberally with a brush or a spray after the surface accumulation of dirt and grease has been removed by scraping. The solution is scrubbed into the surface for from three to five minutes using a scrub brush or electric floor machine. Surfa-Etch then attacks the alkali with an effervescing action which boils out the film material from the surface pores. Following the treatment the surface should be rinsed for several minutes with clear, fresh water and allowed to dry before application of a sealer. The manufacturer reports that no special clothes, gloves, goggles or aprons need be worn when using Surfa-Etch. It is fume-free, odor-free, noninflammable and will not damage metal surfaces.



HYDRAULIC CUTTER

WEIGHING ONLY 12 lb and just 21 in. in length, the Model 200-A Guillotine hydraulic cutter is reported to cut up to ½-in reinforcing rods with ease. Produced by the Manco Manufacturing Company, Bradley, Ill., the unit is designed to replace larger and more cumbersome bolt cutters.

The Model 200-A operates with a pressure of 8500 psi which enables the operator to exert 10 tons thrust. A newly designed dual ratio pump combines rapid traverse with high power to minimize cutting time. The reduced operator effort necessary for cutting with the new unit minimizes the tendency of the operator to twist while cutting, thereby eliminating a major cause of bolt cutter blade breakage. The cutting blades are of alloy tool steel and can be easily resharpened.

TORQUE-CONVERTER FOR EXCAVATOR

TORQUE-CONVERTER-engine combinations are now available as optional equipment on certain models of Bucyrus-Erie excavators, according to the Bucyrus-Erie Company, South Milwaukee, Wis. The combination is designed to provide a maximum (stalling) torque from 200 per cent to 225 per cent of the full-load torque

possible with straight friction drive on a given excavator unit. The torque-converter automatically balances engine speed to load requirements, so that when output speed is reduced by a heavy pull at the dipper teeth, the engine is speeded up accordingly. It is also stated that the torque-converter provides a cushioning effect to protect the machinery and engine from shock loads encountered in excavator operation.

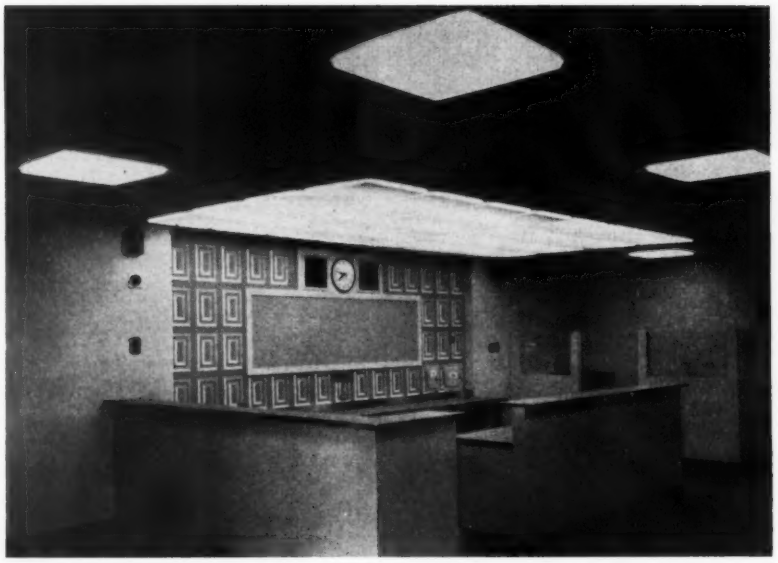
DIESEL-ELECTRIC PILE DRIVER

THE INDUSTRIAL Brownhoist Corporation, Bay City, Mich., has announced production of its first heavy-duty, diesel-electric, full-revolving pile driver. Reported to be one of the world's largest machines of its type, it is known as the No. 15 diesel-electric pile driver. With power-battering leaders 50-ft long which will carry a maximum leader load of 26,000 lb, the machine has a reach of 34 ft 1 in from the center of rotation and 20 ft 6 in ahead of the front axle. The leaders will provide a maximum batter of 3 in per ft and, according to the manufacturer, can be raised to driving position or lowered to traveling position in about one minute.

The pile driver, which weighs 211,000 lb in full-operating rig, is powered by two diesel engines with a combined horsepower of 385.

Each engine drives a General Electric traction generator which, in turn, powers GE travel motors mounted on each of the 6½-in by 12-in trucks. Locomotive gear reduction cases have a built-in disengaging mechanism which can be used when the pile driver is to be transported in a train. The unit has a top travel speed of 20 mph and a maximum drawbar pull of 21,000 lb. It has been designed to haul its own work train and is equipped with air brakes for braking both the driver and the cars it is hauling.

The machine is equipped with a steam-operated pile hammer which is fired by a 115-hp Vapor-Clarkson No. 4630 steam generator with a capacity of 4,000 lb of steam per hour. The unit carries water tanks of 600-gal capacity for supplying the steam generator and fuel-oil tank of 275-gal capacity.



LIGHTING FIXTURES

A NEW LIGHTING fixture line especially designed for use in railroad office buildings, stations and ticket offices has been announced by the Safety Car Heating & Lighting Co., Inc., New Haven, Conn. The fixture line includes square and rectangular units of the same basic design for lighting harmony from room to room.

The units are available for individual or for end-to-end continuous row mounting, and each unit is constructed with dimensions in multiples of 12-in. This enables the fixtures to be installed easily in ceilings composed of regular 12-in ceiling tile. "Safety 68" diffusing panels formed of ⅛-in thick Plexiglas cover each fixture. These panels resist breakage from impact and are guaranteed against discoloration. The manufacturer reports that the panels assure maximum light transmission with low surface brightness and with perfect diffusion over the entire panel surface. It is also stated that any desired level of illumination can be obtained with these units. The fixture housing is of a heavy gauge steel, and the units are finished in a permanent baked white enamel. The reflector is designed to permit access to electrical components and pintle-type hinges permit the removal of the bezel and diffuser as a unit without the use of tools. The units are available with rapid-start or standard fluorescent lamps.

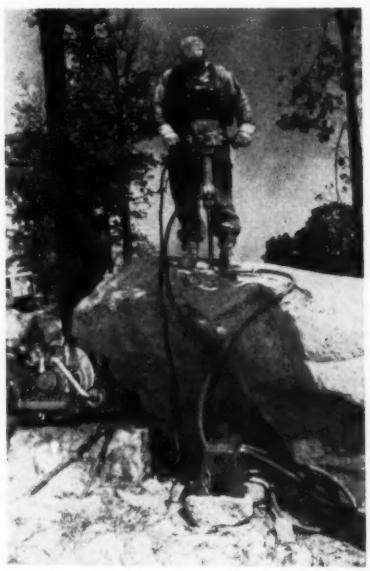
SHORT DRILL FOR CLOSE QUARTERS

A SHORT electric drill, designed to get into tight spots, has been announced by Stanley Electric Tools, New Britain, Conn. The new unit is available in two models, one known as the No. 123, with a ½-in capacity in steel and a 1⅜-in capacity in wood. The other, designated the No. 383, has a ⅜-in capacity in steel and 1⅛-in capacity in wood.

To permit use of the drill in

hard-to-get-at places, the back spade handle and pipe handle are both removable. Construction features of the tool include a die-cast aluminum alloy housing, anti-friction bearings, alloy steel gears and

a momentary contact switch with a push buttom locking device. The drill is equipped with a key-type chuck with a key receptacle in the handle for easy accessability. Both models of the drill may be obtained for voltages from 115 to 250 volts.



ELECTRIC ROCK DRILL

A NEW electric rock drill has been announced by the Homelite Corporation, Port Chester, N.Y. The new unit, which employs a Bosch rock drill, is powered by a lightweight, high-cycle motor requiring no brushes. It is separate from a portable Homelite generator weighing only 130 lb.

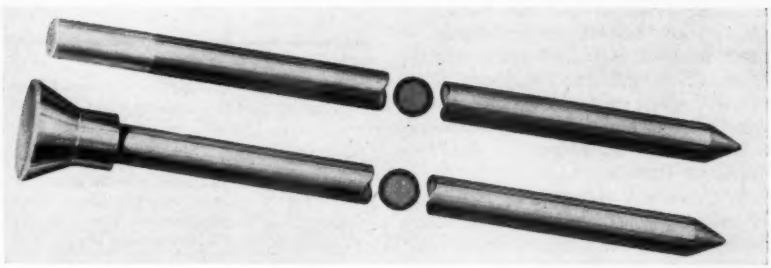
The rock drill, equipped with a Bosch pressure blower, drills blasting holes, wedge holes, split holes and anchor holes in rock, concrete or brickwork.

ALL-WEATHER CAB

A MOLDED steel cab is now available for all models of the Michigan tractor-shovels manufactured by the Construction Machinery Division of the Clark Equipment Company, Buchanan, Mich. The all-weather cab is designed for easy field installation and features all-around and overhead vision through safety glass windows set in rubber moldings. Glass in the overhead window is tinted to eliminate sun glare.

The rear section of the cab is mounted on a track which enables it to roll freely back and forth. This rear section can be removed, if desired, in five minutes and will lock open or closed in any position. A quick-release mechanism frees the lock when the cab is pulled back to open. Windows in the rear section are of the sliding type. The cab unit, which weighs approximately 275 lb, is furnished with a windshield wiper as standard equipment and a heater and defroster as optional equipment. The interior of the cab is sprayed with an insulating compound to deaden noise.

This new cab is an addition to other styles of cabs previously introduced for the Michigan line.



SURVEY MARKERS

A NON-RUSTING survey marker which is designed for use in locating permanent survey points, is now being offered by the Copperweld Steel Company, Pittsburgh, Pa. The marker consists of a steel core to which a copper covering is molten-welded, thereby providing strength for driving and, at the same time, providing corrosion protection.

The marker is available in two different types, one with a tinned-end extending down 1½ in from the top, and the other with a compression-fit 1½-in diameter bronze head, which provides space for center-punching a precise point of reference. The former is available in ½-in or ⅝-in diameters, and is designed for use in uneven or heavy-foliaged terrain. The latter is supplied in a ⅝-in diameter and can be driven flush with pavements, roadbeds, bridge buttresses or other surfaces. Standard length of the markers is 3 ft; however, other sizes can be furnished on special order to fill any particular need.

WHAT'S THE ANSWER?...

. . . a forum on track, bridge, building and water service problems

Diesels and Curve Maintenance

What effect, if any, has the introduction of diesel locomotives had on the maintenance of line and gage on curves? Is it more or less difficult? Explain.

Diesels "Kinder" to Track

By Assistant Division Engineer

The replacement of steam with diesel locomotives has generally reduced the problem of maintenance of line and gage on curves. However, it has also introduced a new factor at many locations—increased curve wear on rails—and this in its advanced stages, indirectly, creates a gage condition.

There seems little question in the minds of maintenance personnel that diesel equipment is "kinder" to the track structure than steam. Heavy steam freight locomotives had sufficient rigidity and side sway to distort both line and gage on curves. While this effect was gradual, it was progressive to the point that realinement and regaging were prime factors in any track-maintenance program. Poor joint surface, which frequently occurred on the low rail of curves, contributed to both line and gage conditions. This surface problem was often found on sections of track where both freight and passenger trains were operated at widely different speeds.

With diesel equipment a better distribution of weight, greater flexibility through the trucks, and more nearly uniform train speeds for both freight and passenger trains seem to obtain. As a result the detrimental factors inherent in the steam locomotive are nullified. On this basis, it is natural to assume that better line and gage can be maintained with an expenditure of even fewer man-hours.

However, full credit should be given to the heavier rail sections, larger tie plates, and improved rail fastenings which have become more widely used during the period that diesel power was replacing steam. Greater mechanization of track ballasting and resurfacing, with more uniform, efficient and economic results, is another phase of the maintenance picture which may be contributing to better line and gage on curves.

The improved conditions of track maintenance now being obtained is undoubtedly the direct result of all these factors, and is dependent, to some extent, on each factor for the total effectiveness of the net result.

Curve Maintenance Reduced

By C. Halverson
General Roadmaster, Great Northern, St. Paul, Minn.

Our railroad is not fully dieselized. There is, however, one division where diesels have been in service for about three years. Exceptionally heavy tonnage, most of which is iron ore, is handled on this territory.

The haul is 116 miles long. Fifty miles of this are single track on which only ore is handled. Sixty-six miles are over the eastbound track of a double-track main line where the tonnage consists of iron ore, grain and lumber products.

The ruling grade for eastbound trains is 0.2 per cent. There are 82.62 miles of tangent track, 0.94 miles of 1-deg, 7.50 miles of 2-deg, 6.17 miles of 3-deg, 2.20 miles of 4-deg, 1.77 miles of 5-deg, 0.16 miles of 7-deg and 0.30 miles of 8-deg curves.

The track is laid with 112 and 115-lb rail on 8½-in by 12-in or 13-in double-shoulder tie plates.

The diesel locomotives consist of three units of 1,500 hp each, with an axle load of 60,000 lb. These locomotives handle 180-car trains of about 16,000 tons each. Approximately 120 million gross tons have been handled over this line during the three years we have had diesel operation.

Prior to dieselization, steam engines, with a weight on the drivers of 537,880 lb and an axle load of

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Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, Railway Track and Structures, 79 W. Monroe St., Chicago 3, and reach him at least five (5) weeks in advance of the publication date (the first of the month) of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

To Be Answered In the January Issue

1. What dollar savings may be expected to accrue in connection with the removal of little-used main-track turn-outs? Explain.

2. Considering all factors, what are the relative economic advantages of cold-process built-up roofs and hot-process built-up roofs for most types of railway buildings? Explain.

3. What are the relative merits of jacks and pans for the control of ballast unloaded from commercial hopper-type gondola cars? Explain.

4. To what extent, if any, has the introduction of diesel locomotives affected the cost of maintaining bridges? Explain.

5. What, if any, advantages can be gained from the setting of ballast stakes to the base of rail rather than the top of rail? Explain.

6. What is the most economical method of disposing of the chromate wastes from diesel-engine water-cooling systems? Explain.

67,200 lb, handled the same tonnage per train.

Despite their larger number of wheels, the steam engines, with their heavier axle loads and high center of gravity, have a less uniform weight distribution than the diesels, and develop a severe lateral thrust against the rails. The diesels with a lower center of gravity and power uniformly applied to each axle through gears, develop a less concentrated lateral thrust against the rail. This results in a decrease in the distortion of the gage and alinement of the curves under diesel power. This reduction was particularly noticeable on curves sharper than 3 deg.

On another division there are 124 curves within a distance of 121 miles. The maximum curvature is 3 deg. On this line passenger service is 100 per cent dieselized. Although there are some steam locomotives in freight service, there has been a reduction in the maintenance of line and gage on curves because of the larger number of diesels which are operated.

Roller Applicators for Paint Crews

To what extent should roller applicators be used by paint crews? What are the advantages of these rollers? The limitations? Explain.

Preferable to Brushes

By Leo J. Denz
Chief Carpenter, Chicago, Milwaukee, St. Paul & Pacific, Chicago

We have used roller applicators for applying paint on a number of our structures in the Chicago Terminals and have found that they are preferable to brushes where the general surface is flat and smooth. When painting beaded or V-ed material on walls and ceilings it is difficult to get a good job with a roller. In these cases a brush does a better job. We have also found that the paint covers considerably better with a roller than with a brush.

In a terminal such as Chicago, where it is usually necessary to hire new men to start the painting program each season, we find that we are unable to get experienced painters and that inexperienced men can do a much better job with a roller. If there are one or two experienced men in the crew they can of course do the brush work on the trim. We have found that where we have had experienced painters, accustomed to using a brush for a number of years, it was more or less difficult to get them to switch to using a roller. However, even these men, after they had used a roller, admitted that it really was a better way of applying paint, especially when only one coat was being spread.

It is my belief that, whenever a roller can be used to apply paint, it should be used in preference to a brush. This, of course, applies to house painting and not to steel bridge painting where it is necessary to get the paint in all the corners and crevices.

We have found that it is a good practice, using a brush, to paint a strip approximately two inches wide at the corners of both the ceiling and the walls before the roller is applied. This does not emphasize the difference in application methods as much as when the brush is applied after one has gone as far as he can with the roller.

Repairing Stone Box Culverts

What is the most effective method of repairing stone box culverts where the capstones have failed? Explain.

Objects to Word "Failed"

By Leo D. Garis
General Bridge Inspector, Chicago & North Western, Chicago

Before answering and explaining this question, I would like to take exception to the use of the word "failed." In most cases where a crack is found in the bottom of a cover stone in a stone box culvert, that particular stone is, no doubt, broken into two pieces. However, bearing friction and the soil pressure at the ends of the 12-in to 16-in thick cover stones used on the Chicago & North Western prevent much displacement of the stone, and in many cases the existence of these broken stones has been tolerated for a few years before any repairs have been made. There is no record on the C&NW of a rapid development of broken or cracked cover stones and I am of the opinion that the word "failed" should be limited to conditions requiring immediate attention.

There are about 1200 stone box culverts on the North Western. All of these culverts were built between 1860 and 1908. The largest of them are known as 6-ft by 8-ft culverts. The top two courses of the wall stones of these larger culverts are, however, stepped in to give a 4-ft clear span for the 16-in thick cover stone. There are a few smaller culverts with the smallest ones shown on the old drawings as 2 ft by 2 ft.

Where the stone used for construction was a very hard quartzite, no cover stones have cracked or broken. In the harder limestones the broken cover stones have been very few. With the softer and more common limestones, however, cover stone breaks have been very common. Practically the only repairs made where a broken cover stone is the only defect have been to notch a short length of T-rail, base up, into the top of the wall to support the broken stone. No plans or general instructions have ever been issued to cover this simple construction. Rails of all sections have been used and there are now hundreds of these repairs, many of which have been in place for over 50 years. This type of repair has not been frequent in the last 10 years, and this probably indicates that most of the stones which would ever break have now been repaired.

The stone box culverts on the C&NW have not been expensive to maintain and the percentage that have been replaced with pipes due to a combination of poor walls, delayed maintenance and broken cover stones has been very small. Where replacement with pipe has been made, the pipes have nearly always been placed alongside the old box which has then been filled and the ends plugged. When this has been done, there have been cases where the filling of the old

box and the plugging of the ends have not been adequate to withstand floods. Recently, however, we have been very careful with such back filling and have used several yards of concrete to plug each end of the abandoned culvert.

In 1943, the C&NW took over the inspection of bridges and culverts of the Chicago, St. Paul, Minneapolis & Omaha where it was common practice to place galvanized metal pipe inside stone-box culverts and back fill with concrete between the old box and the new pipe. This type of repair has been satisfactory and I know of no case where the slight reduction in the area of the opening has caused flood trouble. This type of repair is not made at present time without full investigation of the drainage area.

Repairs to individual wall stones have been made by removing the disintegrated portion of the stone and replacing it with concrete. Unless the wall stone is removed to a depth of one foot, the new concrete must be doweled to the old stone. Precautions must be taken to prevent removal of enough of the wall to seriously weaken the structure.

Each Failure Separate Problem

By G. W. Benson
Superintendent Bridges, Central of Georgia, Macon, Ga.

This question implies that the usual investigation has been made and, after this inspection and application of a recognized drainage formula, repairs can be made which include one or more failed capstones.

Economical and practical repair of failed stones in a stone box culvert is limited to the following:

(1) Stone box with opening large enough to permit some reduction in cross section.
(2) Where the failed capstones are readily accessible from the top, either at toe of fill slope or within few feet of the base of rail.
(3) Where the culvert is of sufficient size to permit repair work from inside, possibly in combination with (2) above.

Failures of these stones are usually clean breaks, either at one wall or near their center, and often occur in combination with the bearing stone on the bench wall, although we find occasional disintegration. Our stone boxes are comparatively old, some having been in service over 100 years. By far the greater portion were laid dry with very little dressing, particularly on the large base and capstones, although the roof joint was tight or protected by a cover stone. Over the years, pointing and grouting has been done to varying degrees.

Where the section of the culvert can be reduced, and the break in the capstone or stones occurs at one wall, a small brick or concrete wall can be used to support the stone. If the break occurs in the center, a small wall can be used to support the failed stones. If the stone or stones show disintegration and drift must be considered, construct two small walls with a reinforced concrete top or thread a pipe or pipe arch through the failed portion and fill the void between the threaded pipe and failed box with stone and pressure grout.

Where easily accessible, uncover the failed portion or entire top of the culvert and remove the failed stone and replace with a reinforced concrete top or pour a concrete cap on top of the stones. Selection of the repair method will depend on type of failure, condition of stone, headroom, train schedules, etc.

On long boxes under high fills, the greater portion of the repair work must be done from the inside.

If the failure consists of a single clean break and the stone is otherwise good and not sagged enough to offer obstruction to the waterway, it is usually possible to point the crack and support and reinforce the bottom corners of the failed stone with heavy bars or rods, steel angles or scrap rails, so placed that the bottom corner of the stone bears on the bottom leg of the angle or the base of the rail.

If the stone is disintegrated or cannot be reinforced as above it must be removed. It can then be replaced with scrap rails of sufficient length to provide good bearing. These rails should be laid workway with bases touching and the void above the rails should be filled with concrete.

If the failure involves a number of stones, these stones should be removed. They may be replaced with rail and concrete as described above or with reinforced concrete. The stones should be removed one at a time and the new construction placed as this removal progresses. Prior to starting repair work a piece of scrap pipe should be driven through fill to the top of culvert and this pipe used for placing concrete in the void left after removal of the last stone. There is now on the market a manually operated earth augur which will provide a 4-in hole 25 ft deep cheaply and quickly. On one occasion, we used a pile driver to sink a long scrap pipe. These repairs often save a very costly replacement.

These remarks apply to permanent repairs. Emergency repairs can often be made with suitable second-hand timber.

It must be remembered that each failure of this type presents a separate problem and that the economical and practical solution of that problem is the duty of all concerned.

Use Corrugated Pipe

By L. P. Drew
Assistant Chief Engineer, Union Pacific, Omaha, Neb.

If the drainage area will permit of a reduction of some 25 per cent to 40 per cent in the effective waterway, the most economical and satisfactory method is to thread a corrugated-metal riveted-joint culvert pipe through the present opening, the space between the corrugated pipe and the stone box to be backfilled with either dry sand or cement-sand grout, placed under pneumatic pressure.

If the effective waterway cannot be reduced, it is usually as economical to repair the existing culvert as outlined above, then place an additional culvert opening alongside, using corrugated metal pipe installed by the jacking method.

Replace With Precast Slabs

By E. S. Birkenwald
Engineer of Bridges, Southern, Cincinnati, Ohio

Stone box culverts, because of the limited strength of the capstones, provide limited waterway at best, with a maximum width of waterway opening not much greater than four feet. The chances are that, in addition to capstone failure, the mortar cementing the stones of the culvert has deteriorated and many have washed out, thus causing movement resulting in the breaking of the capstones.

If the cover of fill and ballast above the capstones is light and the mortar cementing the stones

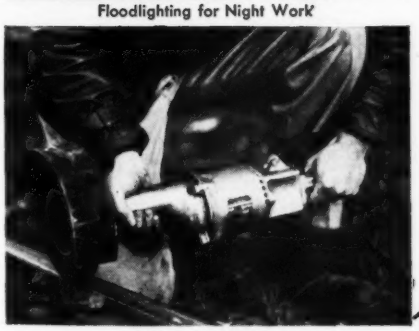
(*Continued on page* 64)

Homelite High Cycle Chain Saw

High Cycle Impact Wrench

Standard Universal Power Drill

Floodlighting for Night Work



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What's the Answer (Cont'd)

together is in good condition, a precast reinforced concrete slab may be installed to replace the failed capstones. Because of the unevenness of the walls it may be necessary to spread a rich mortar bed between the top of walls and the underside of the precast slabs. If rail support is needed, two rails bolted together, with steel blocks between them, will serve as an equalizer and support for a single running rail.

In the event that the cover of fill over the capstone is more than a few feet deep, it will probably be cheaper to replace the entire box with a metal pipe culvert, which can be jacked into place. If rock is present in the fill it may be necessary to use metal tunnel liners. This tunnel liner should be galvanized and field coated with a suitable bituminous material. In either case the stone box culvert should then be plugged.

If the flow line of the box culvert has not been altered during the life of the culvert and if it has been determined that the waterway can be reduced, it may be possible to thread a metal pipe, having the required waterway opening, through the failed culvert. The space between the metal pipe and the box culvert should then be filled with a lean grout which can be placed by pressure grouting methods.

Capstones Designed Empirically

By F. H. Cramer
Bridge Engineer, Chicago, Burlington & Quincy, Chicago

Stone culverts were built with vertical side walls spaced from two to four feet apart. They were capped with large stones which spanned the opening between these walls. Because of the uncertainty with reference to the true transverse strength of building stone, a large factor of safety above the supposed ultimate strength of the stone was used. Many stone boxes were, therefore, built according to empirical rules which dictated that the thickness of the capstones should be as follows:

For a 2-ft span, 10 in.
For a 3-ft span, 13 in.
For a 4-ft span, 15 in.

Where it is necessary to repair these capstones, enough stone in each of the walls directly under the supports should be removed to

permit the insertion of steel rails which should then be shimmed tight against the capstones. The openings in the walls around the ends of these rails should then be backfilled with cement grout. In those cases where the capstones are completely broken, the rails should be placed close together on the wall seats, and backfilled with lean grout.

Bolts in Switch Rods

Should the bolts in switch rods be placed head up or head down? How important are the cotter keys in these bolts? Explain.

Rules Require Heads Down

By C. C. Van Stratten
Roadmaster, Missouri Pacific,
Jefferson City, Mo.

On our railroad it is a violation of the Maintenance-of-Way Rules to insert switch-rod bolts other than from below, or to leave them without cotter keys. I cannot find any good reason or purpose for switch-rod bolts to be inserted any other way than from below. There are two reasons for this.

(1) The bolt is easier to apply during the original application, as it is a difficult task to tighten the nut on a bolt when it is underneath and between the ties.

(2) The matter of inspection should alone be cause enough to require insertion of the bolt from below. This allows for frequent and easy inspection of the bolt to determine if the nut is tight and key in place. If the nut were below, it would require the one making the inspection to get down and feel or to use a mirror to see if the nut and key were still in place. With the nuts on top in plain view they are noticeable to every one passing them and may be observed by signalmen, switch tenders, section forces and others more frequently than if inspection required these men to get off their motor cars to see that the bolts were in proper order.

With reference to the importance of the cotter key, I do not think of the switch-rod bolt as having been installed, other than temporarily, until it has been keyed.

(*Continued on page 66*)

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What's the Answer (Cont'd)

Some seem to feel that the key is of little importance on a good switch bolt that is properly tightened, but again this is a safety factor which prevents the nut from turning. On inspections when the cotter key is missing it is almost certain that the nut is loose or has been struck by something, and needs attention.

Switch-rod bolts should, for all safe and practical purposes, be inserted from below and cottered with a good cotter key and the key spread to prevent its moving in the cotter hole.

Head Down Protects Threads

By N. J. VITO
Roadmaster, Delaware, Lackawanna & Western, Buffalo, N. Y.

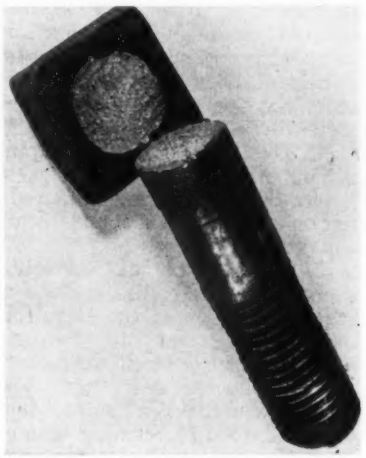
Switch-rod bolts should be placed head down. This leaves the threaded portion of the bolts up in position to be properly lubricated to protect the thread life. This position also makes it easy to make adjustments, and saves time when changes are to be made. Bolts applied in this position increase the reclaim percentage as bolts applied head up usually have to be burned off because of the rust action which takes place on the threads of a bolt when hidden in the tie crib.

A cotter key is most important in these bolts, especially when the bolts are applied head down. The only reason for applying a bolt to a switch rod head up is to prevent the bolt from falling through in case the nut came loose. A cotter key will prevent this from happening.

Cotter Key Prevents Loosening

By W. A. SCHUBERT
Division Engineer, St. Louis-San Francisco, Chaffee, Mo.

This is an interesting subject and one of importance to track men. No one will disagree that the switch, in its best condition, is the weakest link in the track structure, and that the switch-rod bolts play an important part in making the switch safe.



BROKEN CONNECTING-ROD BOLT which prevented a switch failure because it was installed head down with a cottered nut on top.

The bolts in the switch rods and connecting rods should, without question, be placed with the head down and the nut on top. The nut must be properly protected by a cotter key to prevent it from coming off should it work loose. This position of the bolt also permits proper inspection at the required

(*Continued on page* 68)

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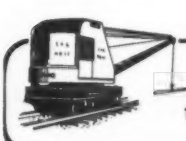

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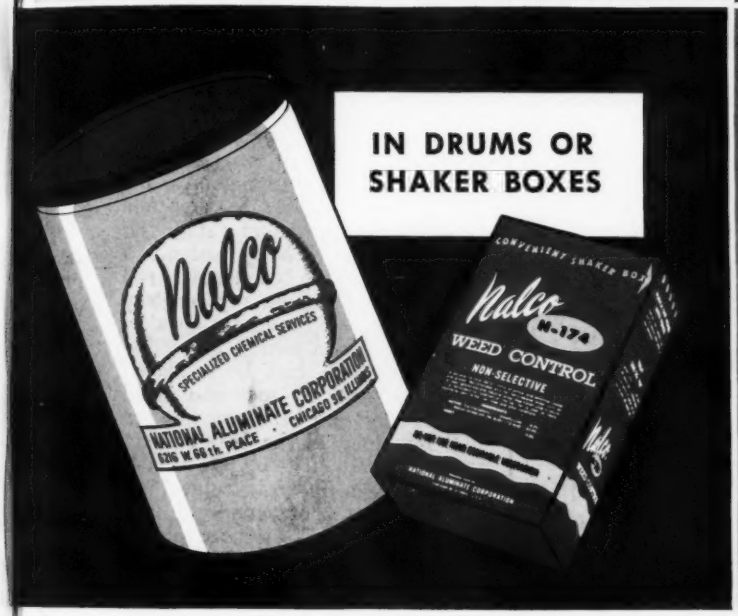

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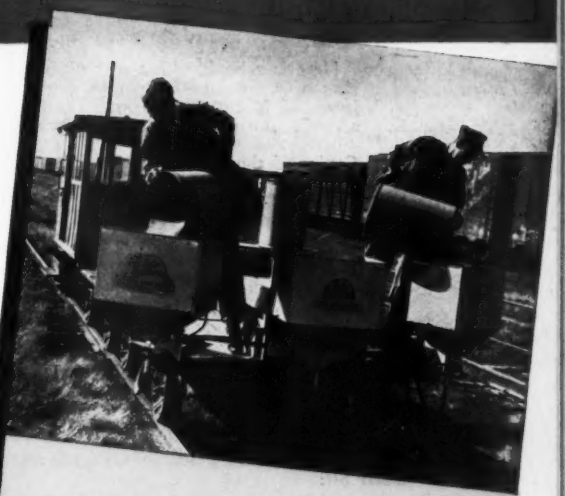

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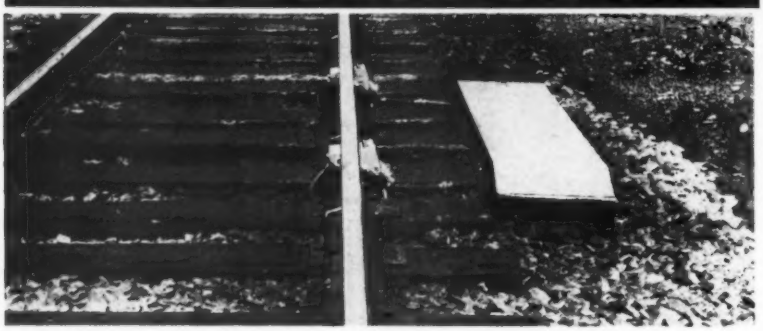

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intervals to insure that the bolt, nut and cotter key are in good condition.

If the bolt is placed with the head up and the nut and cotter key down, it can not be properly observed. It would also be difficult to tighten the nut and apply the cotter key in head-up position, since there is not sufficient room between the headblock ties to work on the nut. Thus, for practical reasons alone it is proper to place the bolts with the head down and the nut and cotter key on top.

There are some who will argue that the bolt should be placed with the head on top, to provide proper protection, should the nut come off the bolt. This, of course, is not a good stand to take, since switch inspections should be made at frequent intervals to see that all switch bolts, etc., are in good shape and the switch is in safe condition.

To further prove my stand on this issue, I wish to submit a photograph of a connecting rod bolt which failed on my territory and which was found by an alert track gang on a switch inspection tour. This bolt had been placed with the nut on top and head down. The head broke off but the bolt remained in the hole so that the rods were held in place. Had this bolt been put in with head up, no protection whatever would have been left and a serious accident might have resulted.

Check Tightness Continually

By L. W. Howard
Valuation Engineer, Illinois Central, Chicago

All switch-rod bolts and connecting-rod bolts should be placed head down so that the position of the nut and cotter key will be above the rod and can be readily inspected at any time.

It is extremely important that cotter keys be used in all switch-rod bolts to avoid a dangerous condition which would result from nuts working off under traffic. Cotter keys should be inspected regularly, nuts should be kept drawn up tight, and bolts should be lubricated to prevent rusting. However, bolts should not be allowed to become covered with grease to such an extent that good inspection is impossible. Should worn cotter keys be found, they

should be replaced immediately, and the tightness of bolts should be regularly checked to prevent undue wear and rattling during the movement of trains.

Place Nuts "Top Side"

By Leo V. Levesque
Extra Gang Foreman, Bangor & Aroostook, Fort Kent Mills, Me.

Bolts in switch rods should be placed with heads down and the nuts "top side." This gives the inspector a better view and a better chance to keep nuts and threads oiled or coated with preservatives, as they should be, in order to facilitate the removal of bolts for the changing of switch points. Cotter pins of the proper size and length are an absolute necessity as nuts should not be squeezed too tightly on switch-point clips, and without the cotter pins nuts could easily work loose.

Head Down Aids in Inspection

By Section Foreman

The heads of switch-rod bolts should be placed down with the nuts on top in plain view. In this position the nut may be easily inspected to determine if it is "backing off" each time a man walks over the switch or rides by on a motor car. Another advantage develops from the ease with which the nut can be turned down from the top, but easy inspection is the main reason for this practice.

The nut on the bolt joining the switch-stand crank to the connecting rod should also be on top.

Some foremen contend that it is safer to put these bolts in place with the head up so that if the nut does work off the bolt will be held in place by the head. This is a poor practice since the bolt could easily be jarred out of position by a train moving over the switch once the nut came off.

The cotter pin prevents the nut from backing off the bolt and causing a derailment. It gives complete insurance that the nut will never completely back off. Track crews should inspect these pins often and make sure they are properly spread. Pins of the correct size should always be used, and wires or nails should never be employed for this purpose.

Gaging New Rail

When rail is renewed on track having irregular gage, should the first line of new rail be gaged to the old rail? Why? If not, how should the new rail be gaged?

Use One Gaging Foreman

By Emilio Geraro
General Foreman—Track, Pennsylvania, Philadelphia

When rail is to be renewed on track having irregular gage, the work should proceed as follows. A day or so before the rail renewal starts, line one rail perfectly, then renew the opposite rail first.

Select one foreman with enough men to do the gaging. Make him responsible for maintaining uniform gage. Do not assign more

(*Continued on page* 72)

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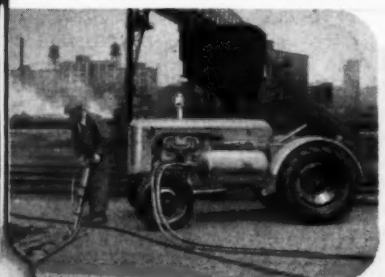

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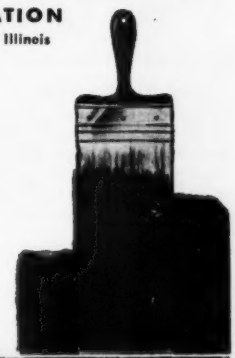

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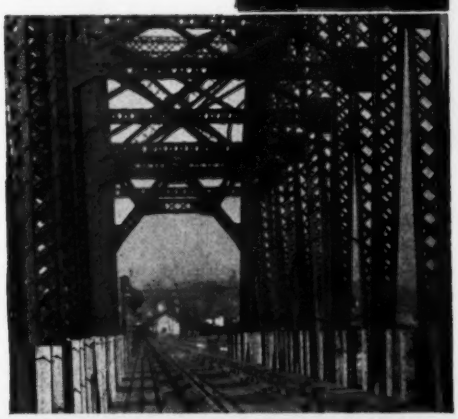

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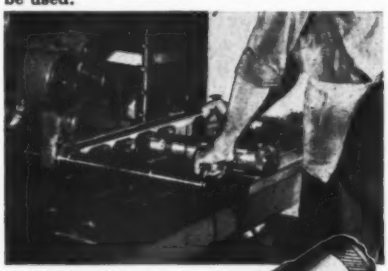

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What's the Answer (Cont'd)

than one foreman to this work because, in my experience, no two foremen on any rail-renewal job can carry the same gage.

After one rail has been laid to perfect gage renew the other rail and gage with the same gaging foreman. This is the only way you will obtain proper line and gage. Before you return the track to scheduled speed, see that enough rail-holding spikes and plate-holding spikes have been placed to maintain proper gage.

Line Track Before Renewal

By JOHN L. DELL
Track Supervisor, Baltimore & Ohio, Garrett, Ind.

When renewing rails it is generally more practical and economical to gage the first line of new rails to the remaining line of old rail, regardless of existing irregular gage.

Immediately preceding rail renewal, the track should be very carefully lined without regard to the kinks, due to irregular gage, left in the "gage" rail. The first line of new rail should then be set in opposite the straight "line" rail and gaged to it. Most of the irregularity will be eliminated with the gaging of the first string of new rails.

Since there will usually be some deflection in the joints of the old rail, new rails should not be gaged opposite the old joints, and in extreme cases the ties adjacent to the joint should also be jumped. While this will leave irregular gage, this defect will be eliminated when the second string of new rail is gaged to the first.

Before gaging any rail it is very important that the tie plates be straightened so that the rail will rest freely between both shoulders of the plate, with no strain or distortion in line. Too often the new rail is gaged at every third or fourth tie, while one shoulder of the intermediate plates will be under the rail. Within a few days this may result in track with more irregular gage than existed in the old rails. Careful study will indicate that the tie plates should be straightened mechanically with a jig or some device that will place every plate in correct position relative to the other rail. Hand labor is much too expensive for such an operation.

Unless spike holes are bored, gage spikes should be carefully driven their full length by hand. If the spikes are only started and later full driven by a mechanical spiker there will be deflections and the gage will not be correct. Considering the effect on crossties of repeated respiking, it would seem that boring holes for all spikes would be a great saving. Certainly when new rail is placed in the track, the gage should be correct so that respiking will not be required within a short time.

At locations such as station platforms, bridges and highway crossings the rail gang occasionally will find the track cannot be lined in preparation for rail laying. At such locations the first string of new rail should be lined with an instrument and spiked without regard for gage. The second string of rails should then be gaged to the first. At such locations it is often necessary to lay in both strings of rails before a train is permitted to operate over the track, as the variation in gage may be dangerous. Under such conditions, the efficiency of large rail gangs may suffer.

(*Continued on page* 74)

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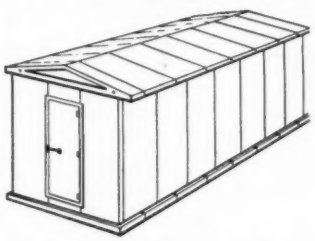


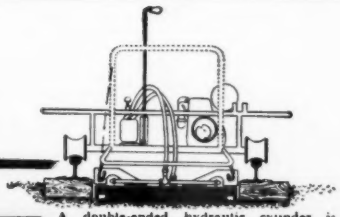
6 ft., 8 ft., 12 ft., wide Buildings — Lengths in increments of 2 ft. for maintenance free structures for equipment or personnel shelters. Weatherproof and fireproof — shipped knocked down for easy field assembly.

PERMACRETE
PRODUCTS CORPORATION
COLUMBUS 7, OHIO

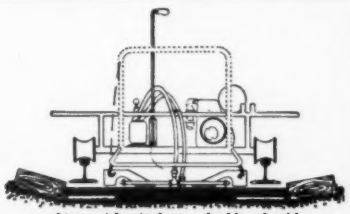
Booths Foundations Crossing Slabs

NO MORE TRENCHING!
NO MORE JACKING UP TRACK!

This **WOOLERY**
TIE-REMOVING TEAM
NOW ELIMINATES SLOW, COSTLY METHOD



A double-ended hydraulic cylinder is then lowered into the tie bed. A simple turn of the valve moves these two pistons outward, *pushing the tie-ends completely clear of the rail—whether working with single or double shoulder tie plates!* The crib is now open—and only the necessary amount of ballast is removed to admit the new tie.



After the tie has been cut on both sides by the WOOLERY Tie Cutter, the operator of the Tie-end Remover—(who follows closely behind so that operators can assist each other in removing machines from track)—lifts the center section out with tie tongs.

Use the WOOLERY TIE-END REMOVER in conjunction with the improved model NU WOOLERY TIE CUTTER! It's the *perfect team* for greater savings on tie renewals—and gives *smoother, safer track, too!*

The trend toward heavier rail and double shoulder tie plates has made removing tie-ends increasingly difficult. With the WOOLERY Tie-end Remover, this task can now be done *in less than a minute by one man with no more effort than that required to turn a valve!*

WOOLERY
MACHINE COMPANY
2919 Como Ave. S. E., Minneapolis 14

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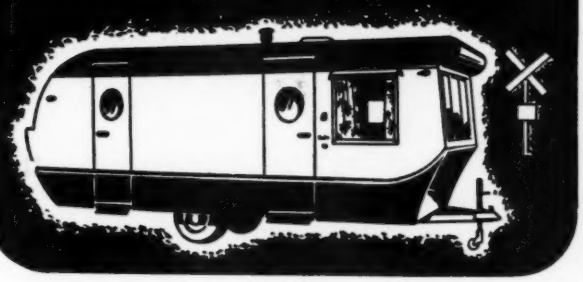
HOUSING for REPAIR CREWS
"Off the Road"

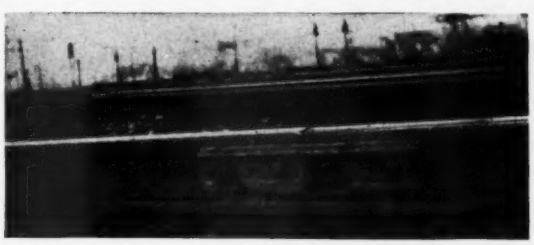


RICHARDSON mobile units furnish an economical way to house repair crews, keeping repair trains off the road. These mobile units sleep crews comfortably. Many railroads have found the use of these RICHARDSON units a practical and convenient manner in which to move crews from place to place.

For complete information and prices write directly to the RICHARDSON factory.

Richardson
TRAILER MFG. CO., INC.
ELKHART, INDIANA

USE Q AND C STEP JOINTS FOR DEPENDABLE SERVICE



Q and C Compromise Joints are well reinforced and made of alloy electric cast steel or of rolled and forged steel, heat treated, to resist the impacts of heavy service.

If you will specify the average allowance for head wear on old rails we can provide the best possible surface to prevent batter on the rail ends and to reduce maintenance costs.

Ask for Q and C Step Joints on your requisitions.

THE Q AND C CO.

59 E. Van Buren St. Chicago 5
90 West St. New York 6
611 Olive St. St. Louis 1

What's the Answer (Cont'd)

Regardless of method, correct gage is one of the most important factors in rail renewal. Irregular gage has a bad effect on the riding condition of track. Regaging is costly in labor and tie damage.

Close Supervision Important

By H. W. KELLOGG

Engineer of Track—Northern Region, Chesapeake & Ohio, Detroit, Mich.

When renewing rail on any track the first line of new rail should be gaged to the line of the old rail that remains in track in order to keep the operation of trains safe. However, when gaging the first line of rail the foreman in charge of the gaging crew should pay particular attention to the line of the old rail, observing any joints that are cocked either in or out, or any great irregularities in gage due to bent rail. He should make allowances for these conditions so that the new rail will not be gaged to any extreme irregularity. By paying close attention to this particular operation in gaging he will eliminate the small irregularities of gage existing in the old rail.

When laying the second line of new rail it should be carefully gaged to the first line. Track which has good gage should result from this procedure after it has been surfaced and lined.

It is my opinion that one of the most important operations in laying rail is close supervision of the crew that is doing the gaging; the most reliable men and the best spikers should always be used.

Relay Gage Rail First

By L. W. HOWARD

Valuation Engineer, Illinois Central, Chicago

To avoid the transfer of bad gage to track being relaid with new rail, it is always good practice to relay the gage rail first. This gages the first line of new rail to the line rail of the track and transfers the old line to the new gage rail. If this practice can be followed, the second line of rail relaid, which is the line rail, should be in the same position as the old line rail and the effect of irregularity on the gage of the old rail should be eliminated. If the line rail were the first relaid, gage irregularities in the old rail would produce relaid track which is badly out of line.

When relaying curves it is also best to relay the inside or gage rail first. This takes advantage of the fact that line is usually better than gage on curves. It may not be possible to relay the inside rail of a curve first in all cases. This is especially true if rail of a higher section than that removed is being placed. In some instances, this could introduce zero or negative elevation in the curve. In such cases where heavier rail replaces lighter and the inside rail of a curve is laid first, the supervisor must carefully check the super-elevation remaining in the curve after the inside rail is relaid so that a proper slow order can be issued to permit safe movement of traffic until full elevation is restored.

It is best, at all times, to follow the practice of renewing the gage rail first, regardless of the gage condition of the old rail or whether

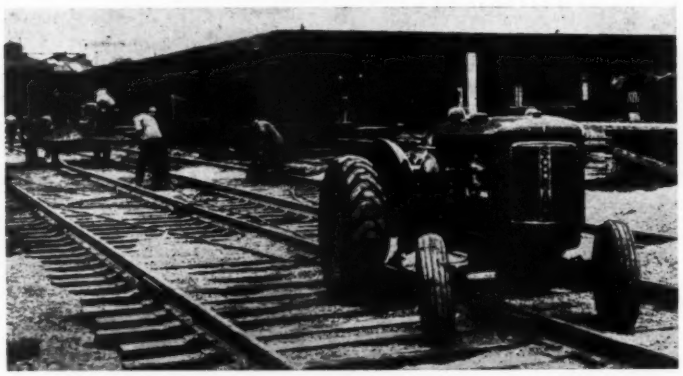
(*Continued on page 76*)

Pneumatractor air output raised 19% . . . 25% to 50% added tool capacity!

Of course you know the *Pneumatractor*, that off-track, go-anywhere compressor that tows, lifts, loads, hoists, augers, snow-plows and performs dozens of other tasks besides supply air for tie tamping and other track and structure jobs.

Now the *Pneumatractor* gives you something else, along with other Schramm exclusives. With air output stepped up from 105 to 125 cubic feet of actual air per minute, the *Pneumatractor* now services 10 to 12 tampers or similar tools instead of eight.

Learn more about the versatile double-dividend maintenance tool that has made such a hit that one railroad now uses over 100 throughout its system. Write for catalog 5340 to Railway Sales Department, Schramm, Inc., West Chester, Pennsylvania.



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TWO INTERNATIONAL TD-14A crawler tractors with matched scrapers restore embankment near Thrall, Texas, following replacement of old rails with new 115-pound rails.

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ON TRACKS ...ON RUBBER

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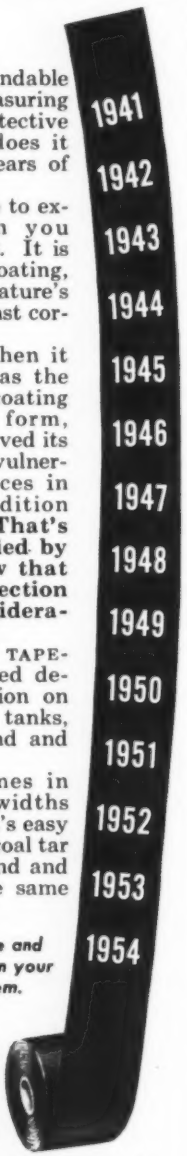
Is the Protection You Buy TIME-TESTED Like TAPECOAT ... the Quality Coal Tar Coating



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Since 1941, when it was introduced as the first protective coating in handy tape form, TAPECOAT has proved its ability to keep vulnerable steel surfaces in "like new" condition year after year. **That's why it is specified by those who know that continuing protection is the first consideration.**

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What's the Answer (Cont'd)

the track is tangent or curved. The only exceptions occur in instances where negative elevation or reverse curvature is encountered.

Recommends Gaging Machine

By W. M. S. DUNN
General Roadmaster, New York, Chicago & St. Louis, Bellevue, Ohio

If rail is being renewed on track where the gage is irregular, it is not necessary, in my opinion, to gage the first line of new rail to the old rail for the reason that there is a gaging machine available. This machine produces very uniform results if one line of the old rail is spike lined and the machine is operated on this rail when laying the first line of new rail. The second line of new rail is then laid from the first line without regard to the existing gage.

Where hand methods are used in laying new rail it is necessary to gage to the old rail. It is, however, possible to eliminate some irregularities by "eye lining" and spiking. This method is satisfactory providing the variation in gage between the first line of new rail and the line of old rail is not too great. If the gage variations are large, it will be necessary to gage to the old rail and line the track immediately after the new rail is laid.

Gage to the "Line Rail"

By JOHN C. ROUSE
Roadmaster, Southern Pacific, Glendale, Ore.

Generally speaking, every railroad has a standard that designates one rail or the other as the given "line side" and it is customary for various reasons to lay the "gage side" first on tangents. The line side will no doubt be in good line while there may be quite a variation of gage on the gage side. These irregularities of gage will be corrected if the gage side is laid first, but, if the line side should be laid first, then the poor gage will be put right back into the line side. One has to lay only a small stretch of rail on the line side and then lay the gage side to appreciate what a difference there is in proper selection of the first side to be laid.

It has always been my practice to lay the low rail on curves first, then, when the high rail is laid, there will be no need for slow orders to protect bad line.

It is an easy matter for the foreman to control the creeping of the joints on the low rail if it is laid first. This may be accomplished by using short rails or by cutting so there should be no excuse for laying the high side first.

When the new rail of a heavier section is laid on the low side first, one must not overlook the necessity of reducing the train speed around curves because of the difference in elevation.

The proper speed for the change of elevation can be ascertained from the rules and specified by train orders, with further protection by signals, until both sides of the curve have been laid.

There is a very important exception to this rule of laying the low rail first and that is when laying in light-curve territory and the new rail is of a heavier section than the rail on the low side. In this instance, the new rail will be higher than the outside rail; in other words, the elevation becomes reversed. In this case, one has to lay the outside rail first, regardless of the quality of work obtained, unless the curve is short and both sides can be laid the same day.

The question of which side of a switch to lay first is controlled by a multitude of circumstances and no set rule can be given except that, where possible, lay the frog side first.

NEW BOOK

Notes on Railroad Location and Construction Procedures, from the School of Experience. By J. A. Given, retired location engineer, Southern Pacific Company. Published by the American Railway Engineering Association, 59 E. Van Buren St., Chicago 5. Forty-three pages, 7½ in by 5 in. Price: $.50 for single copies, $.40 for two to twenty-four copies, and $.35 each in lots of twenty-five or more.

The book contains chapters on Reconnaisance, Preliminary Surveys, Location, and Construction, all of which include a large amount of practical data, short-cuts, and "tricks-of-the-trade"—learned the hard way in the school of experience and from the author's associations with other experienced engineers. This material is not to be found in the usual textbook. The discussion of field work is prefaced by a general chapter which contains valuable suggestions respecting the personal qualifications of engineers and their relationship to engineering work.

THE MONTH'S NEWS
Railway Personnel

General

D. D. Hogue, assistant to division roadmaster on the Great Northern at Great Falls, Mont., has been appointed assistant trainmaster with headquarters at Vancouver, B. C.

Engineering

Frank M. Kaylor, bridge and building supervisor at Valdosta, Ga., has been promoted to assistant division engineer at Knoxville, Tenn., to succeed **Robert K. Seals,** who has been advanced to division engineer at Greensboro, N. C.

H. F. Bird, supervisor of bridges and buildings on the New York Central at Syracuse, N. Y., has been promoted to district engineer of structures, Line East and Boston & Albany, with headquarters at New York, to succeed **K. L. Miner,** who has retired after 42 years of service.

A. L. Ray, supervisor of track on the Grand Trunk Western at Durand, Mich., has been appointed to the newly created position of division engineer, Detroit division, with headquarters at Detroit. The position of assistant engineer, Detroit division, has been abolished.

Harold L. Pitner, assistant engineer on the Milwaukee at Chicago, has retired.

Mr. Pitner attended Cornell University where he received a B.S. degree in civil engineering in 1913. He began his railroad service with the Milwaukee in the engineering department at Spokane, Wash., in April 1926. He later served in various engineering capacities in Miles City, Mont., and at Savanna, Ill., before being transferred to the road's general offices at Chicago in November 1938.

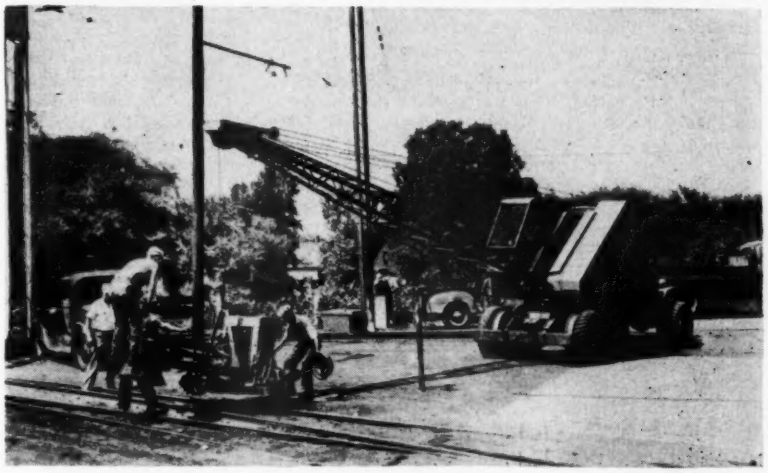
A. P. Crosley, assistant engineer, maintenance of way on the Reading at Philadelphia has been named engineer, maintenance of way at that point, succeeding **T. E. MacMannis,** who has resigned.

(Continued on next page)

Pardon Our Slip

In the "What's the Answer" column which appeared in the August 1954 issue of Railway Track and Structures, we erroneously reported "8-ft" as the flotation depth of the empty steel tank mentioned in the first paragraph of R. A. Van Ness' article on "Anchoring Fuel-Oil Tanks." This should have read 8-in.

Bantam® Spots 1500 lb. Adzer in 1½ Minutes . . .



. . on Track Job for W.C.F. & N. Railroad

To solve their adzer machine handling problem, which formerly required 8 to 10 men a quarter of an hour to remove and replace on the rails, C. V. Formaker, Supt. of Const. and Maint., brought in a high-speed, truck-mounted BANTAM and now does the same job with 1 operator and 2 guide men in just 1½ minutes.

Saves on Other Jobs, Too

Formaker also reports that their BANTAM, with 6-ton capacity, has cut costs and saved manpower on many other kinds of lifting and excavating jobs. He claimed: "We add whole days to our work schedule on widely scattered jobs like bridge building and repair . . . track relaying . . . cleanup and utility work . . . yard stockpiling, with our BANTAM. It's the handiest 'one-man' work gang we have."

Find out how you, too, can cut job costs and save manpower for your road, with a versatile high speed BANTAM, working with any of NINE FAST CHANGE ATTACHMENTS.

A BANTAM easily handles any of these jobs:

- Bridge Repair
- Leveling Right-of-Way
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- Repairing Grade Crossings
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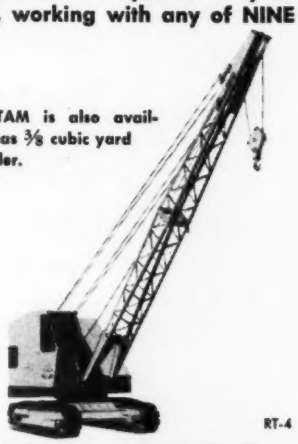
- Stockpiling Materials
- Pouring Concrete
- Digging Sump Holes for Drainage
- Loading out Strings, Caps and Braces

BANTAM is also available as ⅜ cubic yard crawler.



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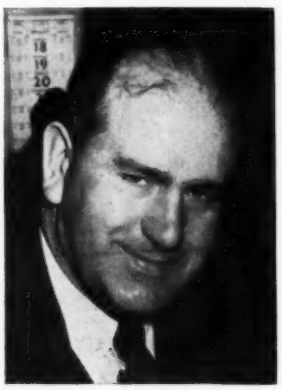
Railway Personnel (Cont'd.)

A. M. Schofield, assistant division engineer on the Pennsylvania at Williamsport, Pa., has been named division engineer at Chicago. **F. S. King,** supervisor track at Mansfield, Ohio, succeeds Mr. Schofield as assistant division engineer at Williamsport.

Foster R. Spofford, assistant to chief engineer of the Boston & Maine has been appointed engineer, maintenance of way, with headquarters continuing at Boston, Mass., to succeed **Harold F. Fifield,** who has retired after 42 years of railroad service, during 26 of which he held the above-named position with the B&M. **Henry S. Ashley,** assistant engineer, maintenance of way, at Boston, has succeeded Mr. Spofford as assistant to chief engineer; **Oscar C. Benson,** division engineer of the Terminal division, has replaced Mr. Ashley; **Thomas K. Dyer,** assistant division engineer, has been advanced to division engineer; and **Jacob S. Andrews,** supervisor of welding at Boston, has been promoted to assistant division engineer to succeed Mr. Dyer.

Mr. Spofford was born March 26, 1906, at Phillipsburg, N. J., and graduated from Tufts college in 1927. He entered railroad service on March 1, 1929, with the Delaware, Lackawanna & Western, and in October 1929 he joined the B&M as a structural draftsman at Boston. He subsequently served as assistant supervisor of bridges and buildings,



Foster R. Spofford

supervisor of bridges and buildings, and assistant division engineer until 1952, when he was appointed assistant to chief engineer.

J. H. Brown, whose appointment as assistant division engineer on the Frisco at Ft. Scott, Kan., was recently announced (RT&S, Sept., p. 88), was born at St. Louis, Mo., November 27, 1926. He began his railroad service with the Frisco in September 1948 following his graduation from the University of Missouri with a B.S. degree in civil engineering. After serving as a student ap-

J. H. Brown

prentice at Chaffee, Mo., and at Memphis, Tenn., between September 1948 and September 1950, Mr. Brown was appointed student supervisor at St. Louis, Mo. The following month he was named assistant roadmaster on the southwestern division south at Ft. Worth, Tex. In May 1951 he was promoted to roadmaster on the River division at Chaffee, Mo., and served at that point until his recent promotion.

W. G. Stagge, whose promotion to division engineer on the Baltimore & Ohio at Newark, Ohio, was announced recently (RT&S, September, p. 90), was born on February 1, 1915 at Cincinnati

(*Continued on page* 80)

USE TIE PLATE LOCK SPIKES

for Minimum Annual Cost of Ties in Track

• hold gage • prolong life of ties
• save maintenance expense

LOCK SPIKES hold tie plates firmly in place on cross-ties and bridge timbers. They are quickly and easily driven, or removed, with standard track tools. Driven to refusal, the spread shank is compressed by the walls of the hole. Tie plates are held against horizontal and vertical movement under spring pressure. Play between the spike and the hole is eliminated—gage is held and plate cutting is overcome.

LOCK SPIKES not only become integral with the tie plate, but also the lateral pressure by the legs against the sides of the tie hole, binds the spike in the tie. This unique feature gives tight adhesion between tie and plate.

LOCK SPIKES were first installed in 1947. Since they have been in track, no maintenance whatever has been required. Cost of installing in track is low and comparable to cut spikes. The advantages and saving only found in Lock Spikes reduces the annual cost of ties in track and maintenance expense to a minimum. We invite your investigation.

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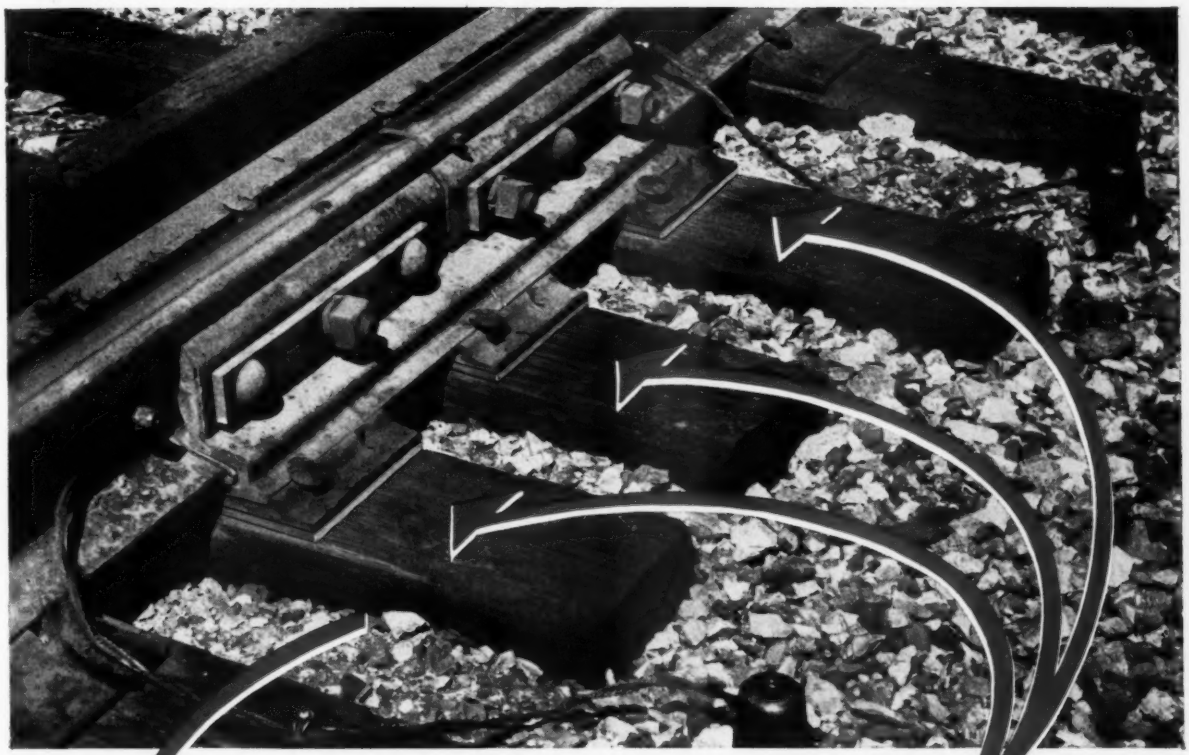

Low cost protection for insulated joints

THE BURKART TIE PAD
with the permanent seal

You are looking at an expensive installation on any right-of-way. The insulation in this joint is costly . . . and when it breaks replacement costs are very expensive.

Burkart Tie Pads, installed on joint and shoulder ties of insulated joints, absorb the shock of impact and materially reduce wear and damage to the insulation. Averaging only 15% to 25% of the cost of insulation, the Burkart Tie Pads shown above are truly low cost protection.

Add this to the extra life these pads give to the ties themselves and you have a typical example of why M/W engineers specify Burkart Tie Pads wherever track maintenance costs are high.

SEE FOR YOURSELF how rugged Burkart Tie Pads save money at other trouble spots—on bridge ties, switches, curves, even on your straightaways. Send for sample, prices or additional information. If you wish, an experienced Burkart technical representative will gladly consult with you.

All Burkart Tie Pads are coated to provide a permanent seal.

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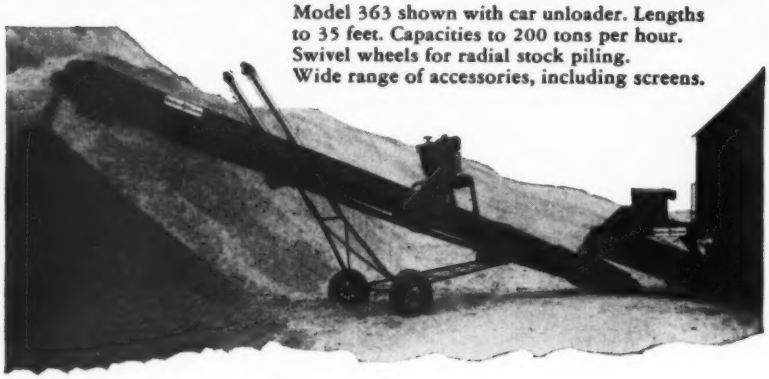
Model 363 shown with car unloader. Lengths to 35 feet. Capacities to 200 tons per hour. Swivel wheels for radial stock piling. Wide range of accessories, including screens.



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MOVE with machines that are truly portable — easily moved around the yard, or towed on the highway.

MOVE materials continuously with less horsepower, less labor, less cost.

MOVE today toward greater profit.

Model 374 shown with flanged wheel for radial stock piling. Available with steel wheels or pneumatic tires. Lengths to 60 feet. Capacities to 430 tons per hour. Wide range of accessories, including vibrating screens.

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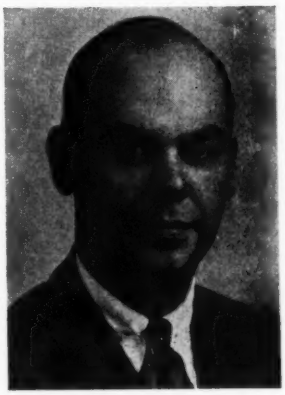
Railway Personnel (Cont'd)

Ohio, and was graduated in civil engineering from the University of Cincinnati. Entering the service of the B&O in November 1938 as a blueprinter at Cincinnati, he was later appointed assistant on the engineering corps. In September 1941 Mr. Stagge joined the



W. G. Stagg

armed forces as a second lieutenant and served through March 1946, having attained the rank of major. Upon his return to the railroad in June 1946, he was appointed assistant division engineer at Newark, and in September 1947 was transferred in that capacity to Baltimore, Md., where he was serving when he received his recent promotion.

Henry W. Neuebaumer, who has been appointed division engineer on the Southern Pacific at San Francisco (RT&S, September, page 86) was born at Oakland, Calif., November 28, 1908. He began his railroad service with the Southern Pacific as rodman at San Francisco in June 1927. He later progressed

Henry W. Neuebaumer

up through the engineering department to the position of assistant engineer, but during the depression period he worked on various track, B&B and water service gangs as a laborer, and later as a foreman. In 1941 he was promoted to general foreman on the Coast division and the following year was made roadmaster on the Los Angeles division at Los An-

geles. He was named assistant division engineer at Los Angeles in 1944 and served in that capacity until being appointed construction superintendent at Los Angeles in 1949. He was again appointed assistant division engineer in 1951, this time on the Sacramento division at Sacramento, the position he was holding at the time of his recent promotion.

Track

Thomas C. Cobble, assistant supervisor of track on the Southern at Clinton, Tenn., has been prjomoted to supervisor of track at Asheville, N. C., to succeed **John H. Hall,** who, as announced elsewhere in these columns, has been appointed bridge and building supervisor at Valdosta, Ga. **Roy Hixon,** supervisor of track at New Orleans, La., has been transferred to Lawrenceburg, Ky., to replace **John T. Marlowe,** who has been transferred to Ludlow, Ky., and **Joseph C. Montz,** assistant supervisor of track at Cincinnati, Ohio, has been promoted to succeed Mr. Hixon at New Orleans. **Denman H. Phillips,** assistant supervisor of track at Knoxville, Tenn., has been advanced to supervisor of track at Clinton, Tenn. **Weston R. Yocum,** has been appointed assistant supervisor of track at Danville, Ky., to replace **Farris Schackelford,** who has been transferred to East St. Louis, Ill.

Mr. Cobble was born on September 25, 1908, at Midway, Tenn., where he entered the service of the Southern as a track laborer in June 1923, transferring to Mosheim, Tenn., in August 1936. He was appointed section foreman at Midway in August 1937, in which capacity he served at various locations until November 1951, when he was advanced to assistant supervisor of track at Clinton.

Mr. Montz was born on March 31, 1925, at Lions, La. He entered the employ of the railway in September 1950 as a rodman at New Orleans, becoming junior engineer there in November 1951. In March 1952 he was made student apprentice at Cincinnati, and since June 1952 has served as assistant supervisor of track at that location.

Mr. Phillips was born on August 7, 1919, at Coosa, Ga. Entering the Southern's service as a section laborer at Ellenwood, Ga., in November 1937, he became relief section foreman there in March 1940. After serving in various capacities along the railway, he was made section foreman at Atlanta in June 1946, and was appointed assistant supervisor of track at Knoxville, in November 1951.

J. C. McConnell has been appointed acting roadmaster on the Rock Island at Belleville, Kans., succeeding **M. Johnson,** who is off because of illness. **K. H. Carl** has been named acting roadmaster at Herington, Kans., in place of **A. Mills,** who is on leave because of illness. **Lee K. Dunn** has been made acting roadmaster at Haileyville, Okla., in place of **R. Stephenson,** who is also on leave because of illness. **G. M. Brum,** who has been on leave since June because of illness, has returned to his position as roadmaster at Enid, Okla.

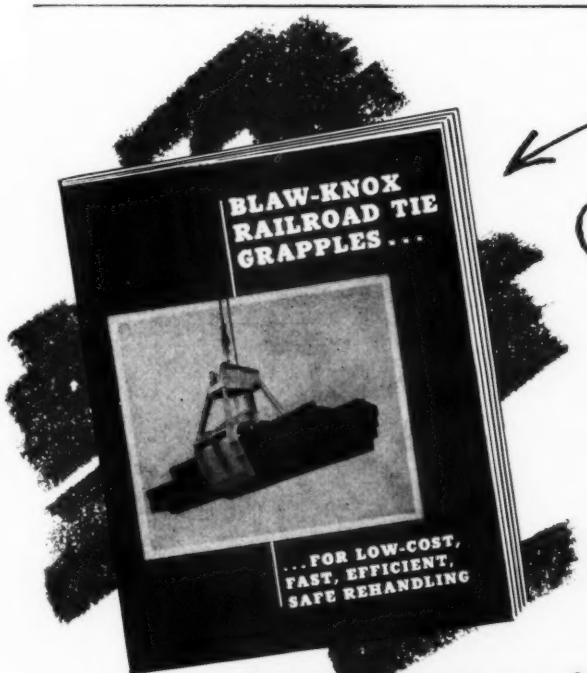
C. W. Carlman, assistant supervisor of track on the Detroit division of the Grand Trunk Western, has been appointed acting supervisor of track on the Holly and Saginaw subdivisions with headquarters at Durand, Mich., succeeding **A. L. Ray,** whose promotion to division engineer is noted elsewhere in these columns.

Thomas F. Carter, Jr., assistant chief engineer on the Missouri-Kansas-Texas at St. Louis, Mo., has been named chief engineer at that point, succeeding **Kenneth H. Hanger,** who has retired after 34 years of service.

George Trembecki, relieving roadmaster on the Canadian Pacific at Calgary, Alta., has been promoted to roadmaster at Kneehill, succeeding **G. Stewin,** who has been transferred to Wetaskiwin, Sask. Mr. Stewin replaces **J. P. Rogiani,** who died recently. **J. Marik,** assistant roadmaster in charge of ballasting on the Maple Creek subdivision, has been promoted to roadmaster at Empress, Alta., succeeding **S. Brownstone,** who has been transferred to Winnipeg.

J. Kramski, assistant roadmaster on the Canadian Pacific at Chaplin, Sask., has been promoted to roadmaster at

(*Continued on page* 84)



This BLAW-KNOX bulletin will help you cut your tie-handling costs!

BULLETIN 2404 gives the complete details, operating benefits and structural advantages of Blaw-Knox Railroad Tie Grapples that result in fast, safe, low-cost rehandling. It explains how you can average from 7 to 12 ties per grab from gondola cars. It describes how *one Blaw-Knox Grapple handled 324 ties in 45 minutes,* from a railroad car to a stock pile! Another grapple averaged 486 ties every 45 minutes. Performance like this is the result of the collaboration of some of America's leading railroad men and the many years of Blaw-Knox experience in designing and building grapples.

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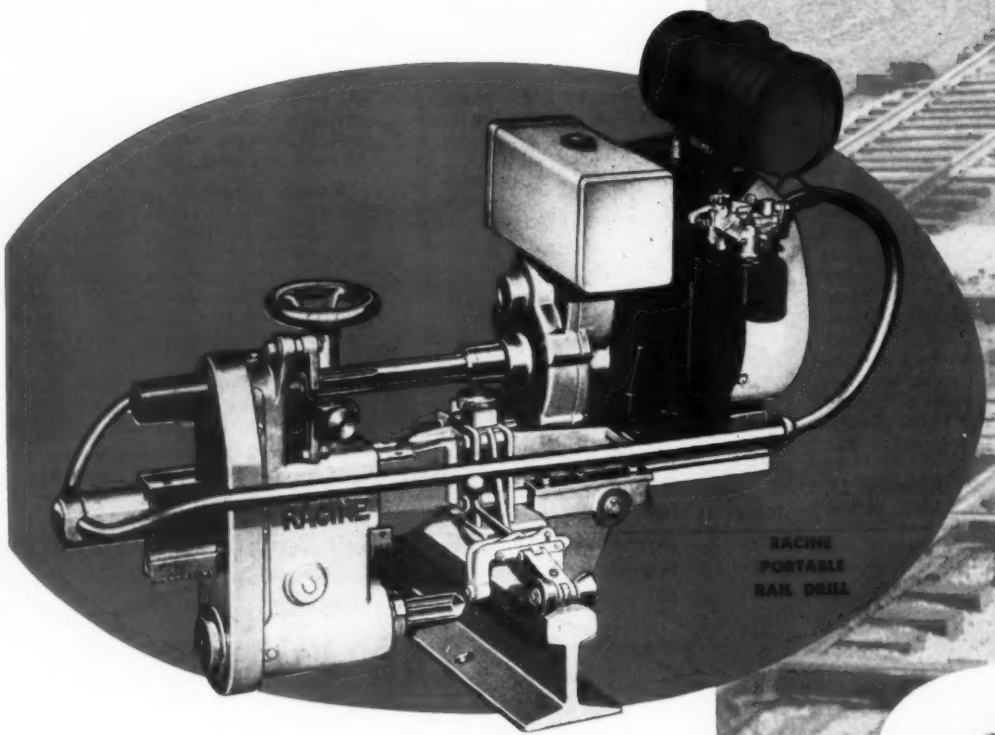

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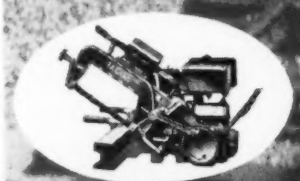

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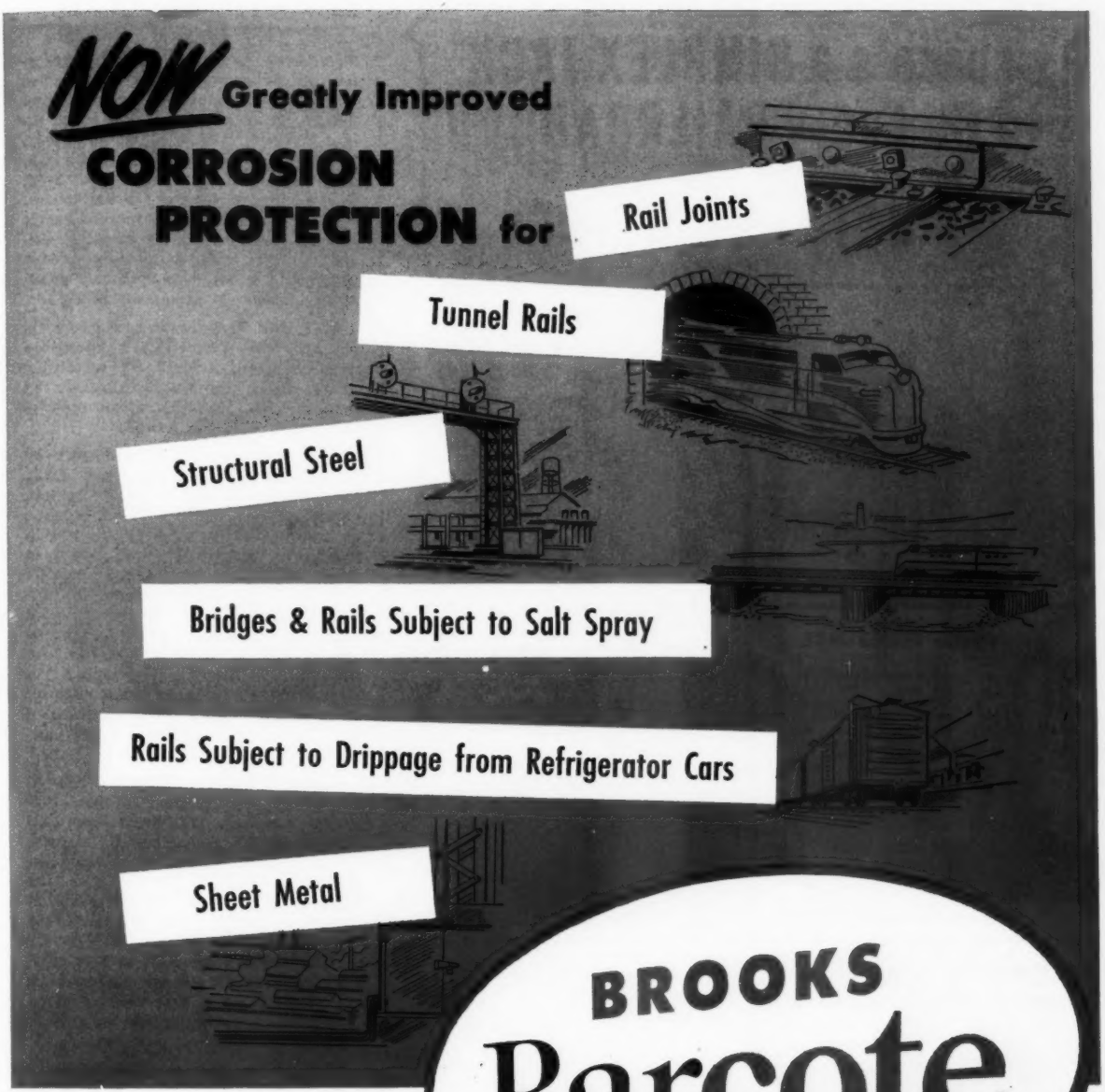

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Fast Acting TRACK JACKS

15 ton capacity. The jacks set much more firmly and stand straighter under tie (without damage) or rail, due to large area toe lifts. Trip from either side. Two models have light weight aluminum housings.

ALSO: Tie removers and replacers.

Standard Speed BRIDGE JACK

The new A2515 25-ton jack has an aluminum alloy housing, which weighs only 40 pounds. 9-in. lift eliminates re-setting in bridge work. Recommended for use with jack support.

ALSO: A complete line of hydraulic jacks and pullers.

Versatile BRIDGE JACK

Lifts, pushes, pulls 15-tons on cap, toe or bolt attachment. Ideal for shimming, lining, painting and replacing timber decks. Two base sizes to fit between ties. Ratchet lowering for safety. Double socket permits use in close quarters.

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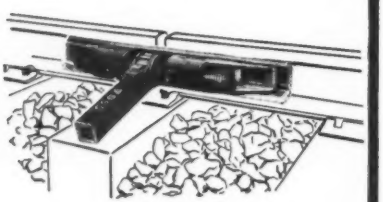
Time-Saving TIE SPACER

Straightens, Spaces Ties. Pumps Rails. Easily applied and removed. Slides along top of rails.

RAIL EXPANDERS for the Maintenance and Signal Departments



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Railway Personnel (Cont'd)

Shaunavon, succeeding **Charles Wheatley.** Mr. Wheatley has been transferred to Wilkie as roadmaster replacing **John Patrick,** who has been transferred to Lloydminster, to succeed **D. A. Fraser.** Mr. Fraser replaces **G. S. Gustofson,** who has retired as roadmaster at Swift Current after 42 years of railroad service.

Mr. Kramski began his railroad career with the CPR in 1912. He served in various capacities in the maintenance-of-way department until he was appointed assistant roadmaster at Shaunavon in 1951.

L. E. Miller, assistant roadmaster on the Milwaukee, has been promoted to roadmaster at Mobridge, S.D., succeeding **A. M. Olson,** who has been transferred to Lewistown, Mont. Mr. Olson replaces **O. Haanes,** who has retired.

J. M. Rankin, supervisor of track on the Pennsylvania at Ashtabula, Ohio, has been transferred to Mansfield, Ohio, to replace **F. S. King,** whose promotion to assistant division engineer at Williamsport, Pa., is noted elsewhere in these columns. **H. D. Tietken,** assistant supervisor track at Huntingdon, Pa., succeeds Mr. Rankin as supervisor track at Ashtabula. **C. R. Spence,** assistant supervisor track at Columbus, Ohio, has been transferred to Huntingdon to replace **Mr.** Tietken. **W. C. Wettach,** junior engineer at Mansfield, has been made assistant supervisor of track at Columbus, succeeding Mr. Spence.

Firman B. Lindsay, Jr., whose promotion to supervisor of track on the Southern at Cochran, Ga., was announced recently (RT&S, September, p. 94), was born on April 8, 1929 at Birmingham Ala. Beginning his service with the Southern as an extra call boy at Meridian Miss., in June 1945, he later served as section laborer at Atlanta, Ga. He became student apprentice at Knoxville, Tenn., in June 1951, and one year later was made assistant supervisor of track at that location—the position he held at the time of his recent advancement.

R. D. White, whose appointment as roadmaster on the Frisco at Chaffee, Mo., was recently announced (RT&S, Sept., p. 92), was born October 30, 1926, at Eufaula, Ala., and received a B.S. degree in civil engineering from Auburn in 1950. He began his railroad service with the Frisco at Chaffee, Mo., as a student apprentice August 29, 1950. In September 1951 he was transferred to Springfield, Mo., where he remained until being appointed student supervisor at St. Louis in September 1952. He was appointed assistant roadmaster in March 1953 and served in that capacity until his recent promotion.

Richard P. Howell, whose promotion to supervisor of track on the Pennsylvania at Logansport, Ind., was announced recently (RT&S, September, p. 94), was born at Sarasota, Fla. on November 20, 1927. Following his graduation in civil engineering from Michigan State College in March, 1949 he entered

(*Continued on page* 86)

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True Temper RAIL ANCHORS have this double-jawed clamp that won't slip

● True Temper rail anchors are built to take a bigger, stronger hold . . . have a double-gripping clamp that prevents rail creepage.

The two-piece construction permits better fulfillment of a rail anchor's function. First, the large clamp provides a greater bearing surface against the tie. Second, the spring serves to hold the clamp tightly against the rail. Each part has a single job. Each job is done better. Result: no slippage, less maintenance, fewer inspections, complete assurance of correct tie alignment and maintenance of proper rail gauge.

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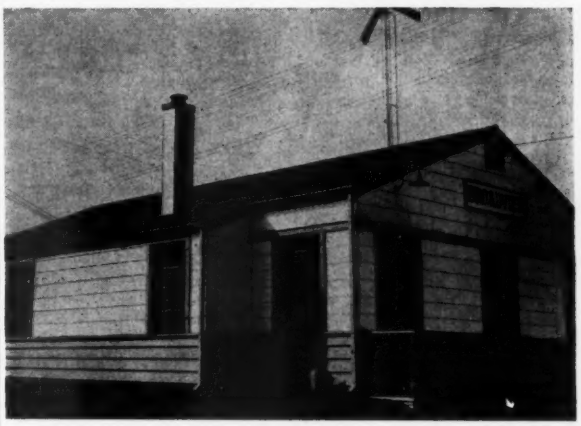
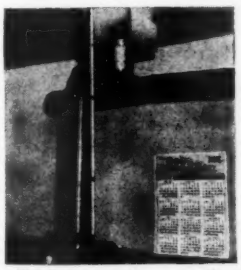
Packaged Masonry Chimney For Railroad Buildings Goes Up in 3 Man-Hours



Van-Packer Chimney gives low-cost safety to this Illinois Central Railroad yard office building in Broadview, Illinois



Triple connection to ceiling suspended chimney inside railroad car repair track building

At right is an exploded view of the Van-Packer Packaged Masonry Safety Chimney. Illustration shows section-on-section construction for ease of installation, even after building has been completed.

LOW COST— The Van-Packer Packaged Masonry Chimney is easily installed in 3 man hours or less as new chimney or replacement of smoke jacks on car repair track buildings, maintenance of way buildings, small diesel repair shops, small passenger stations and freight home office buildings. Section-on-section design makes installation a one man job. Never needs to be replaced. Saves 30% to 50% over brick chimney construction.

34% MORE DRAFT—Can be specified wherever 8" x 12" standard code brick chimneys are used. Develops 34% more draft than brick chimneys, cuts fuel bills.

SAVES SPACE—Ceiling suspended Van-Packer can be placed directly over heating unit, no wasted space. Chimney is supported with 4X factor of safety. Fire-safe, no clearance to wood rafters is necessary.

APPROVED FOR ALL FUELS—Time-tested masonry construction withstands temperatures in excess of 2100° F. Sections have insulating value of 24" solid brick wall. Listed by U.L., A.G.A. for all fuels. Delivered packaged and complete, all parts provided.

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Railway Personnel (Cont'd.)

the service of the PRR as a junior engineer of track in which capacity he served consecutively at Chicago and Cincinnati, Morrow, and Crestline Ohio until April 1951, when he was advanced to assistant supervisor of track at Jamesburg, N. J. In November 1951, Mr. Howell was transferred to Wilmington, Del., and in March 1954 to Canton, Ohio, where he was serving when he received his recent promotion.

H. C. Archdeacon, whose promotion to supervisor of track on the Pennsylvania at Grand Rapids, Mich., was recently announced (RT&S, Sept., p. 94), was born at Philadelphia, Pa., March 6, 1928. He served as a cooperative student at Drexel Institute of Technology and at the same time as chainman with the Pennsylvania on the Philadelphia Terminal division. After receiving his B. S. degree in civil engineering in 1950, Mr. Archdeacon was appointed junior engineer at Philadelphia at which point he served until being appointed assistant supervisor track on the Philadelphia division at Lancaster, Pa., in June 1951.

C. O. Day, whose appointment as roadmaster on the Burlington at Edgemont, S. D., was recently announced (RT&S, Sept., p. 94), was born at Ranchester, Wyo., April 27, 1912. He began his railroad service with the Burlington in May 1930 as a section laborer at Roget, Wyo. After serving as a relief foreman and regular foreman from 1937 to May 1944, he was appointed track supervisor, in which position he served until being appointed assistant roadmaster at Gillette, Wyo., in August 1953. In May 1954 he was appointed acting roadmaster at Alliance, Neb., the position he was holding at the time of his recent promotion.

Bridge & Building

John H. Hall, supervisor of track on the Southern at Asheville, N. C., has been appointed bridge and building supervisor of the Georgia, Florida & Alabama (Southern subsidiary) at Valdosta, Ga., with jurisdiction over the St. Johns River Terminal Company, at Valdosta, to succeed **Frank M. Kaylor,** who, as announced elsewhere in these columns, has been promoted to assistant division engineer at Knoxville, Tenn.

G. A. Peirce, master carpenter on the Baltimore division of the Baltimore & Ohio, has been promoted to general scale inspector at Baltimore to succeed **E. K. Lawrence,** who has retired.

W. J. Jerrow, division master carpenter on the Great Northern at Whitefish, Mont., has been transferred to Spokane, Wash., to succeed **E. W. Johnson,** who has retired. Mr. Jerrow has been replaced at Whitefish by **D. C. Hellickson,** formerly assistant division master carpenter, at that same point. **Patrick Duffy,** bridge and building foreman at Seattle, has been promoted to assistant division master carpenter at Whitefish, succeeding Mr. Hellickson.

Obituary

E. H. Johnson, retired division engineer on the Milwaukee, died of a heart attack at his home in Red Wing, Minn., August 29.

John L. Vogel, who retired on April 1, 1954, as engineer of structures of the Delaware, Lackawanna & Western, died on August 23.

Association News

American Railway Engineering Association

Five committees of the association have scheduled meetings to be held during October. They are: Iron & Steel Structures, William Penn Hotel, Pittsburgh, Pa., October 27 and 28; Wood Preservation, Mayflower Hotel, Wash-

(*Continued on page* 88)

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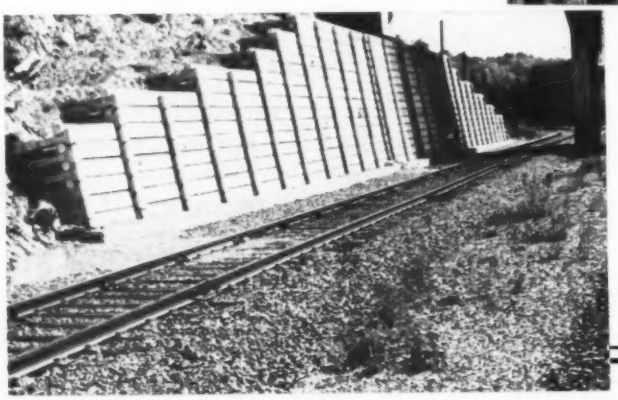

Plants:

Birmingham, Alabama

Blue Island, Illinois (Chicago)

Kansas City, Kansas

Melbourne, Kentucky (Cincinnati)

New Brunswick, New Jersey

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Manufacturers' Literature

Following is a compilation of free literature, pamphlets, and data sheets offered by manufacturers to the railroad industry and advertisers in this issue (items #15-19). Circle the number(s) on the coupon below to receive the information desired; the requests will be sent direct by the manufacturers.

1. TRUCK CRANE. *Harnischfeger Corp.* 16-page catalog bulletin describes, illustrates and gives specifications for the P&H Model 55 Truck Crane "Miti-Mite", reports fully on its design and features, gives special attention to its full convertibility for all services—dragline, crane, magnet crane, shovel, trench hoe, clamshell.

2. EXCAVATOR. *Harnischfeger Corp.* 4-page bulletin on the Model 255 ALC ¾-yard, long-crawler P&H Excavator describes and illustrates the machine, and gives detailed data on the extra-long, wide-crawlers.

3. LAND CLEARING. *R. G. LeTourneau, Inc.* Bulletin 21 describes and illustrates the LeTourneau line of Heavy Duty Electrically Powered and Controlled Equipment specifically designed, engineered and proved for large scale land clearing.

4. CRANE RUNWAY RAILS. *L. B. Foster Co.* 4-page folder (C-1971) "Crane Runway Rails and Accessories" gives specifications and engineering data; accessories include: crane rails, angle bars, crane stops, rail clips, bolts, hook and anchor bolts, and bearing plates.

5. PRODUCTIVE MAINTENANCE. *General Electric Co.* 18-page bulletin (GEA-6087) "Five Steps To Productive Maintenance" gives detailed information on organization to meet the demands that automation will make on an electrical maintenance program.

6. NON-SHRINK GROUTING. *The Master Builders Co.* 16-page folder (E-1c) "Embeco Non-Shrink Method of Grouting" describes successful grouting of heavy equipment with Embeco non-shrink mortar.

7. INDUSTRIAL POWER PRODUCTS. *International Harvester Co.* Complete line of 73 International Industrial products described in 48-page catalog, contains streamlined technical data, provides abundant descriptive material on each piece of equipment.

8. CUTTNG AND WELDING PRODUCTS. *Air Reduction Sales Co.* 52-page General Products Catalog (ADC-662B) "This Is Where To Find The Best Cutting and Welding Products" describes and illustrates the Airco products used in job shops, maintenance departments, and other users of light welding and cutting equipment.

9. DIESEL ELECTRIC PILE DRIVER. *Industrial Brownhoist Corp.* Complete information offered on the new heavy-duty Diesel electric full revolving pile driver, with maximum leader load of 26,000-lbs.

10. CATHODIC PROTECTION. *National Carbon Co. Div. Union Carbide & Carbon Corp.* 12-page booklet (Catalog Section S-6500) covers the "whys" and "hows" of cathodic protection, a complete reference on the mitigation of corrosion of underground and submerged metal structures by the application of an impressed current cathodic protection system using "National" graphite anodes.

11. SNOW PLOWS. *Baker Mfg. Co.* Bulletin (1060) "Baker Snow Plows For Allis-Chalmers Motor Graders and Industrial Wheel Tractors" describes, illustrates and gives specifications for Baker snow plows.

12. LIGHT STRUCTURALS. *Jones & Laughlin Steel Corp.* 24-page booklet (A.I.A. File #13-B) "J & L Steel Junior Beams, The Lightest Hot-Rolled Steel Structural" contains pictures on how these light structurals are adapted to floor and roof design.

13. JIB CRANES. *R. G. LeTourneau, Inc.* Literature available on the LeTourneau Jib Crane line, including Jib Cranes and Electric Hoists, the new products for the materials handling field—equipped with automatic, bimetallic brakes and with upper and lower limit switches for control of lifting hook travel.

14. WELDERS. *The Lincoln Electric Co.* 8-page 2-color bulletin (1337) "Lincoln Shield-Arc Engine-Driven Welders" describes, illustrates, gives specifications and shows typical on-the-job applications of industrial DC welders.

15. HYDRAULIC CUTTER. *Manco Mfg. Co.* Catalog gives complete details and specifications on the Manco Guillotine Hydraulic Cutter (Model 10-A) for wire cutting, portable, available with high speed electric hydraulic pump.

16. TRUCK SHOVELS. *"Quick-Way" Truck Shovel Co.* Complete details offered on four models of "Quick-Way" truck shovels, 3 to 10 ton crane capacity.

17. TRACKWORK EQUIPMENT. *Matisa Equipment Corp.* Literature offered on three new models of trackwork equipment for "scientific railroading", the Matisa adzing machine, the Matisa tie renewal machine, and the Matisa power wrench.

18. RAIL LUBRICATORS. *Moore & Steele Corp.* Complete details offered on M & S Rail and Flange Lubricator as presented in ad in this issue.

19. COAL TAR COATING. *The Tapecoat Company.* Brochure offered giving complete information on Tapecoat coal tar coating, available in handy rolls in widths from 2" to 24".

Reader Service Department **OCTOBER, 1954**
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Association News (Cont'd)

ington, D. C., October 19; Cooperative Relations With Universities, association headquarters, Chicago, October 22; and Waterproofing, Hotel Lennox, St. Louis, Mo., October 11 and 12.

The association reports that sales of the completely revised, rearranged and reprinted AREA Manual of Recommended Practice have far exceeded sales in any previous year. A total of 2,325 new manual fillers have been distributed thus far, 510 being sold as new volumes. Manuals are still available to those who have not yet obtained their copies.

Railway Tie Association

The annual meeting of the Railway Tie Association will convene at the Mayflower Hotel, Washington, D. C., on Wednesday, October 20, although registration will begin at 1 p.m. on the preceding day. A number of addresses and committee reports will be presented which will be of direct or indirect interest to railroad users of treated wood. On the afternoon of October 20 there will be three such addresses, one on "Deferred Tie Maintenance," by J. E. Hansbury, retired head valuation engineer, Engineering Section, Interstate Commerce Commission. Another, entitled "Procurement of Crossties," will be read by Forrest Shinn, tie and timber agent, Nickel Plate Road. The third, entitled "Crossties—a Forest Product of National Significance," will be delivered by W. S. Swingler, assistant chief, Forest Service, U. S. Department of Agriculture.

The program on Thursday, October 21, will include an address by V. C. Hanna, chief engineer, Terminal Railroad Association of St. Louis, on "The Story of Crossties on Class I Terminal & Switching Companies." Also during this session, D. B. Frampton, president, D. B. Frampton & Company, will discuss "Crosstie Production"; E. J. Stocking, executive vice-president, Hobbs-Western Company, will show how "Advance Knowledge of Crosstie Requirements Benefits All"; and R. G. May, vice-president, Operations and Maintenance department, Association of American Railroads, will talk on "The Railway Tie—Its Importance as a Sound Foundation."

Items on the program for Friday, October 22, the concluding day of the convention, will include an address by M. S. Hudson, research chemist, Taylor-Colquitt Company, on "The Role Crossties Can Play in Solving the Hickory Problem"; and the report of the Committee on Checking and Splitting of Crossties.

Mississippi Valley Maintenance of Way Club

The first meeting of the current season was held at the Hotel De Soto, St. Louis, on Monday, September 20. The program dealt with the construction of the Quebec North Shore & Labrador Railroad to tap huge new ore reserves in

northern Canada and Labrador. The speaker was J. W. Buford, vice president of the Hanna Coal & Ore Corp., who presented a technicolor moving picture depicting construction of the new line. The picture was entitled "Ore in '54." It was supplemented by remarks by Mr. Buford on the various design and construction features of the new line.

The next meeting of the club will be held October 11 at the Hotel DeSoto. The speaker will be H. H. Talboys, vice-president, Nordberg Manufacturing Company, whose subject will be "My Country—My Responsibility."

AREA Committee 29, Waterproofing, which will be holding a meeting in St. Louis at that time, will be present in a body at the Maintenance of Way Club meeting. Membership of the Club is now in excess of 700.

Metropolitan Maintenance of Way Club

The first meeting of the club for the current season will be held at the Railroad-Machinery Club of New York, at

Meetings and Conventions

American Railway Bridge and Building Association—Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5. Next annual meeting, September 19-21, 1955.

American Railway Engineering Association—Neal D. Howard, Secretary, 59 E. Van Buren street, Chicago 5. Next annual meeting, March 15, 16 and 17, 1955.

American Wood-Preservers' Association—W. A. Penrose, Secretary-treasurer, 839 Seventeenth street, N. W., Washington 6, D. C.

Bridge and Building Supply Association—L. R. Gurley, Secretary, 201 North Wells street, Chicago 6.

Maintenance of Way Club of Chicago—E. C. Patterson, secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6. Next meeting, October 25, Hamilton Hotel.

Metropolitan Maintenance of Way Club—Secretary, 30 Church street, New York.

Mississippi Valley Maintenance of Way Club—P. E. Odom, Secretary-Treasurer Room 1008, Frisco Building, 906 Olive street, St. Louis 1, Mo.

National Railway Appliances Association—J. B. Templeton, Secretary, Gardner Road, Broadview, Ill.; Lewis Thomas, Assistant Secretary, 59 East Van Buren street, Chicago 5.

Railway Tie Association—Annual Meeting, October 20-22, Mayflower Hotel, Washington, D. C. Roy M. Edmonds, Secretary-Treasurer, 1221 Locust street, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5. Next annual meeting, September 19-21, 1955.

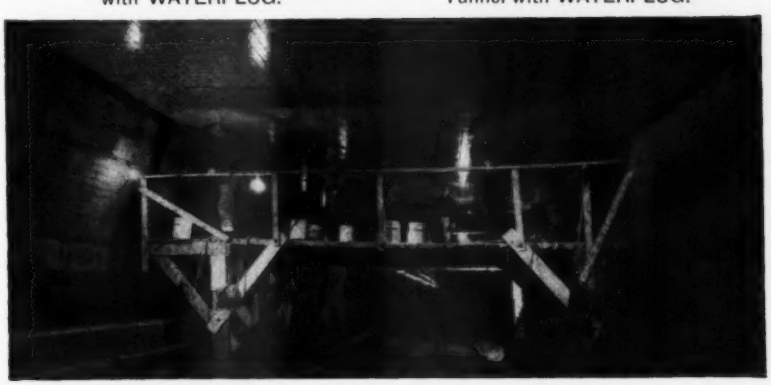
Track Supply Association—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago 5.

Underneath the River!

THORITE Patching Mortar Crew at work in Air Tunnel under East River, New York.

Sealing Leaks in Traffic Tunnel with WATERPLUG.

Sealing Drain Pipe Channels in Tunnel with WATERPLUG.



WATERPLUG Crew at work, before placing of tile lining, Battery Tunnels, East River, New York.

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Association News (Cont'd.)

New York, on October 28. This will be a dinner meeting commencing at 6:30 p.m., the program for which had not been completed at the time this issue went to press.

Maintenance of Way Club of Chicago

The first meeting of the season will be held on Monday, October 25, at a new location selected by the Executive Committee. This is the Hamilton hotel, Chicago, which is located at 20 South Dearborn, between Madison and Monroe. There will be the usual social period starting at about 6 p. m., followed by dinner at 6:30. The program will consist of an address, entitled "Organization and Performance of Mechanized Tie Renewal Gangs on the Santa Fe," by J. E. Eisemann, district engineer on the Gulf, Colorado & Santa Fe at Galveston, Tex. Mr. Eisemann's remarks will be accompanied by colored slides showing the tie-renewal activities of this railroad's highly mechanized gang.

Northwest Maintenance of Way Club

The program committee of the Northwest Maintenance of Way Club has already decided on at least tentative programs and speakers for all of the meetings scheduled for the coming season. All meetings will be held at the Midway Civic Club, 1931 University Avenue, St. Paul, Minn. The first meeting was held on September 23 and was featured by the showing of three sound moving pictures provided by United States Steel Corporation.

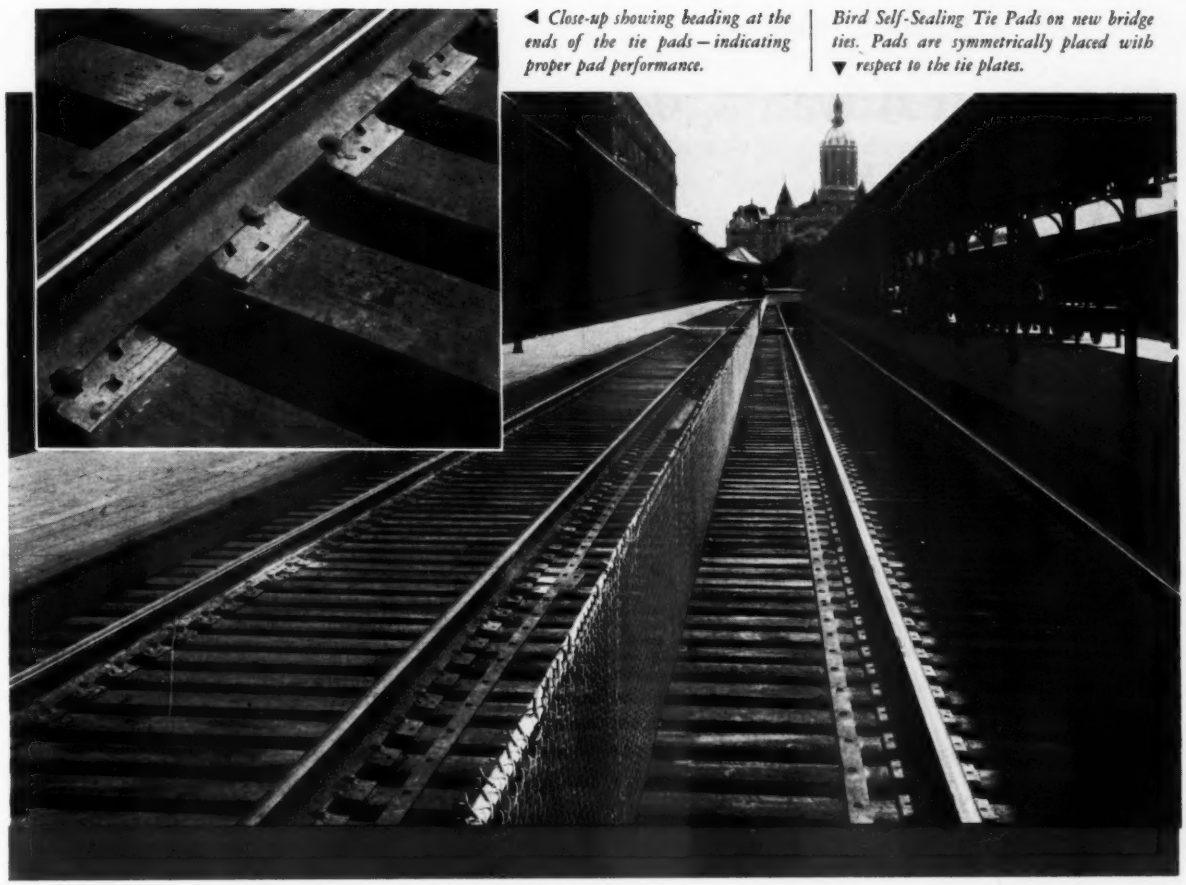
For the next meeting, to be held October 28, the program will consist of an address on "Work Equipment Today and Tomorrow" to be presented by A. H. Whisler, assistant engineer on the Pennsylvania.

Supply Trade News

General

Six new dealers have been appointed to sell and service the Michigan line of excavator cranes and tractor shovels, products of the **Construction Machinery Division** of the **Clark Epuipment Company.** Dealers and territories involved are: Ed Meyer Tractor Company, Mount Vernon, Ill., for southern Illinois; Linder Cox & Co. Lakeland, Fla., for central Florida; Dempster Brothers, Inc., Knoxville, Tenn., for eastern Tennessee and northwest Georgia; Standard Equipment & Supply Co., North Little Rock, Ark., for most of Arkansas; Power Equipment Company, Lubbock, Tex., for

(*Continued on page* 93)



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A 56 page brochure with a comprehensive foreword by James G. Lyne, Editor of Railway Age, containing the prize winner and ten other honorable mention essays in the recent "Inherent Advantages" essay contest sponsored by Warren W. Brown, President, Monon Railway.

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Traffic Manager of Lever Brothers, Ltd., Toronto;

William K. Tate
Vice-President Traffic, NC&St.L Railway;

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University of California at Los Angeles;

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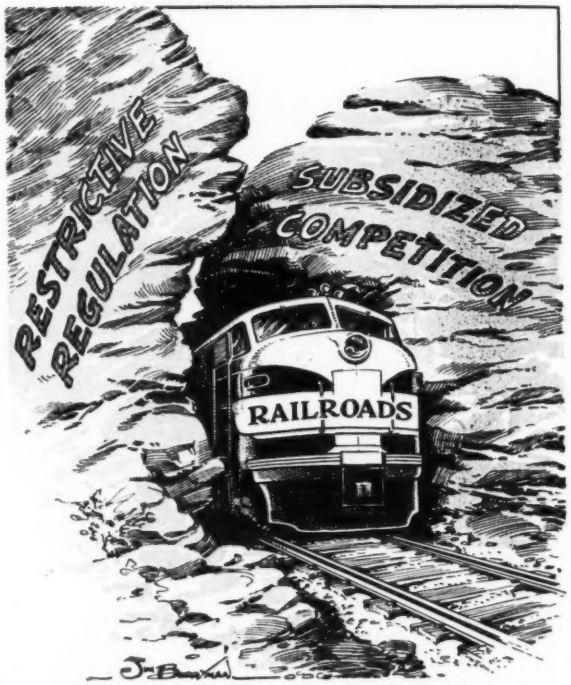

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northwest Texas; and Wilson Equipment Company, Odessa, Tex., for west-central Texas. In addition, the Bode-Finn Company, Cincinnati, Ohio has had its territory enlarged to include 20 counties in central Ohio.

Construction of a new and modern wood-preserving plant will be started shortly at Avoca, near Pittston, Pa., for the **Federal Creosoting Company,** an affiliate of the **American Creosoting Company.** The plant will serve the Lehigh Valley, the Delaware & Hudson and several other users of pressure-treated wood. The principal products will be railroad crossties, switch ties and other treated timbers used by railroads.

Effective September 1, the **Oxweld Railroad Service Company** was combined with **Linde Air Products Company** which has formed a new Railroad Department to conduct the business previously handled by Oxweld. Both companies are divisions of Union Carbide & Carbon Corp. An announcement explaining this development stated that "the combined personnel of Oxweld Railroad Service Company and Linde Air Products Company in the new Railroad Department will be able to serve the railroad field even more efficiently with apparatus supplies, and valuable technical services."

K. I. Thompson, formerly vice president in charge of sales for Oxweld, has been appointed manager of the new Railroad Department of Linde, with headquarters in New York. The present organization of personnel of Oxweld will become the railroad department of Linde.

G. P. Bogert, president, and M. Burnett, Jr., vice president of Oxweld will continue in these capacities to assist in the orderly transition, and Mr. Burnett, in addition, will assume new and important duties in another division of the corporation.

Personal

Cooper M. Schley has joined the sales organization of the **Pennsylvania Salt Manufacturing Company,** with headquarters at Birmingham, Ala. Mr. Schley will represent the Metal Processing and Maintenance Chemicals Departments in the company's Southern territory.

Jack E. Heuser, engine division sales manager for the Le Roi Company, has

(*Continued on page* 95)

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ALADDIN LUBRICATOR

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Maintenance
Costs

62 CLASS I RAILROADS now have ALADDIN Lubricators in successful operation. The ALADDIN is a self-contained valveless *grease* pump. It fits any rail—cuts maintenance on curves, frogs and switches.

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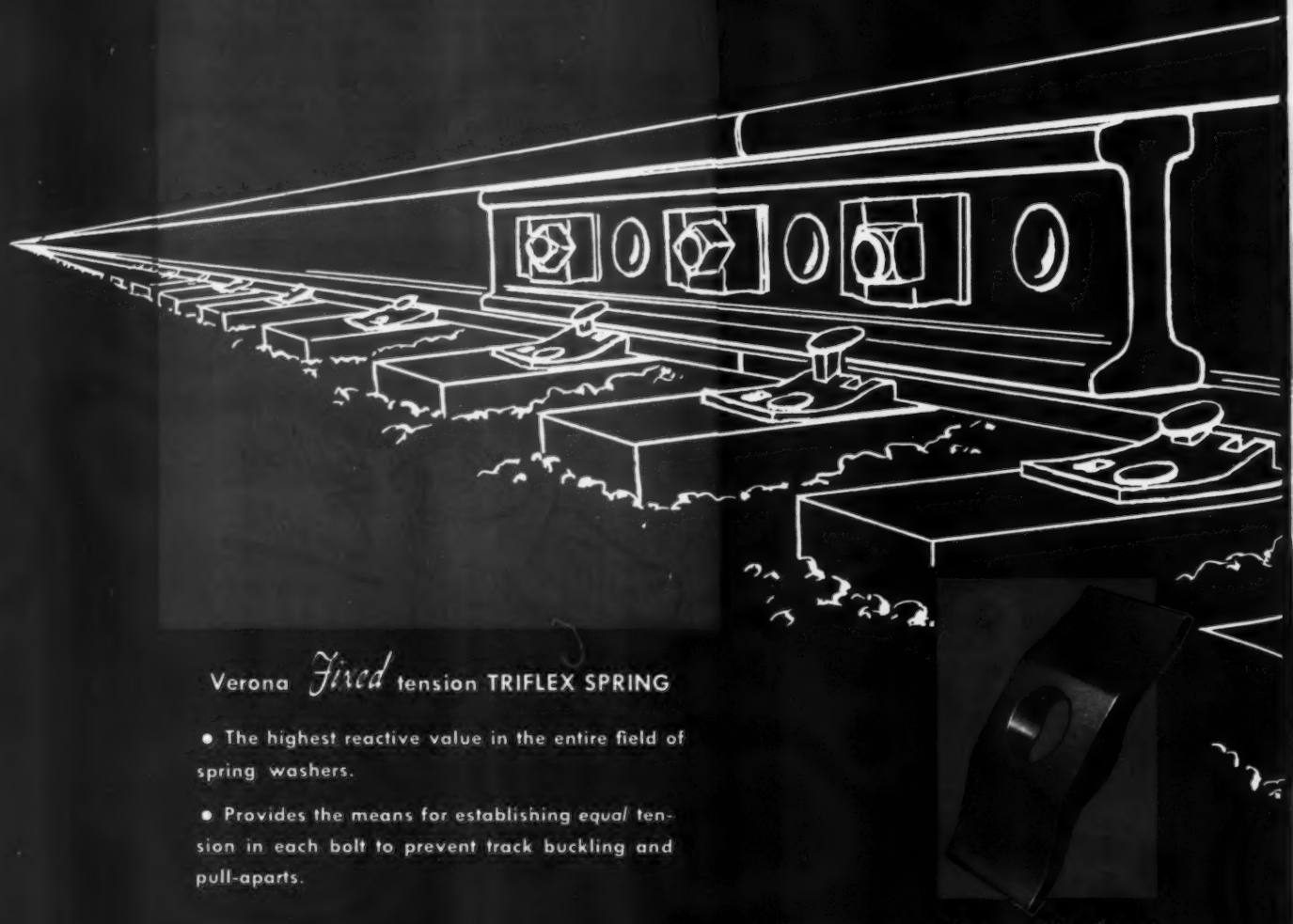

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- Provides the means for establishing *equal* tension in each bolt to prevent track buckling and pull-aparts.

The world's Finest Spring Washer

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TOOL WORKS
Chicago • VERONA, PA • St. Louis

Supply Trade News (Cont'd.)

been appointed vice president in charge of sales with headquarters at Milwaukee, Wis. **Ray H. Rodolf,** sales manager, Construction and Mining Division, has been named general manager, Compressor Division and **Herschel V. Hiatt** director of engineering has been appointed general manager Engine Division.

Mr. Heuser will be responsible for the organization and management of a newly created sales division which will sell and service all Le Roi products. An engineering graduate of the University of Wisconsin, Mr. Heuser joined Le Roi in

Jack E. Heuser

1939. In 1941 he became a member of the Ampco Metal sales organization and served as manager of that company's Pittsburgh and Los Angeles districts until rejoining Le Roi in 1946 as assistant to the general sales manager, the position he held until being appointed sales manager of the Engine Division.

The Camef Equipment Corporation, Chicago, has been named a railroad sales agent to distribute LeTourneau-Westinghouse Equipment and parts.

George W. Casey, formerly superintendent of manufacturing operations for the **Lehon Company,** has joined the railway sales division of that firm at Chicago.

Robert J. Whalen, Chicago District sales manager of the Railway Appliances Division of the **True Temper Corporation,** has been appointed to the newly created position of assistant sales manager of that division, with headquarters at the firm's general offices in Cleveland. **Frank J. Reagan,** sales manager of the division, will continue to have headquarters at Chicago.

Edward F. Schermerhorn, manager of the Insulated Joint Department of **The Rail Joint Company, Inc.,** with headquarters at New York, has retired after 56 years of service with this company. Mr. Schermerhorn's connection with the railroad and railroad supply fields goes back to 1898 when he worked on railroad preliminary and location surveys and as a rodman and mapper in New York state. On November 15 of the same year he entered the service of The Weber Railway Joint Manufacturing Company as a draftsman. In 1901, Mr. Schermerhorn, realizing the dearth of reliable information on insulated joints, started to specialize in this field, eventually becoming a leading authority on insulated joints. In October 1905, The Weber Railway Joint Manufacturing Company was combined with the Rail Joint Company, and Mr. Schermerhorn continued to serve with the latter company, being appointed sales engineer in March 1920 in charge of all matters pertaining to insulated joints. He participated in work that led to the basis of the AAR Signal Section Fibre Specifications of 1923. He served as chairman of a committee representing all manufacturers of rail-joint fibre, and as spokesman of this committee at the AAR committee meetings. He served in this same capacity in 1935 when the fibre specifications were again studied and revised, and also consulted and contributed to the 1952 revision of the specifications. He was appointed manager of Rail Joint's Insulated Joint Department in 1928.

Joseph S. Holzer has been appointed southeastern representative of the Simmons-Boardman railway publications, including **Railway Track and Structures.** His headquarters will be located at 1810 Ponce de Leon Boulevard, Coral Gables, Fla. For a number of years Mr. Holzer has served as sales representative in the New York office of Simmons-Boardman.

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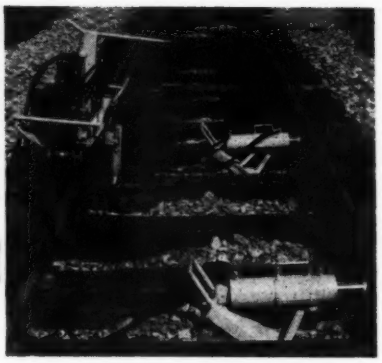
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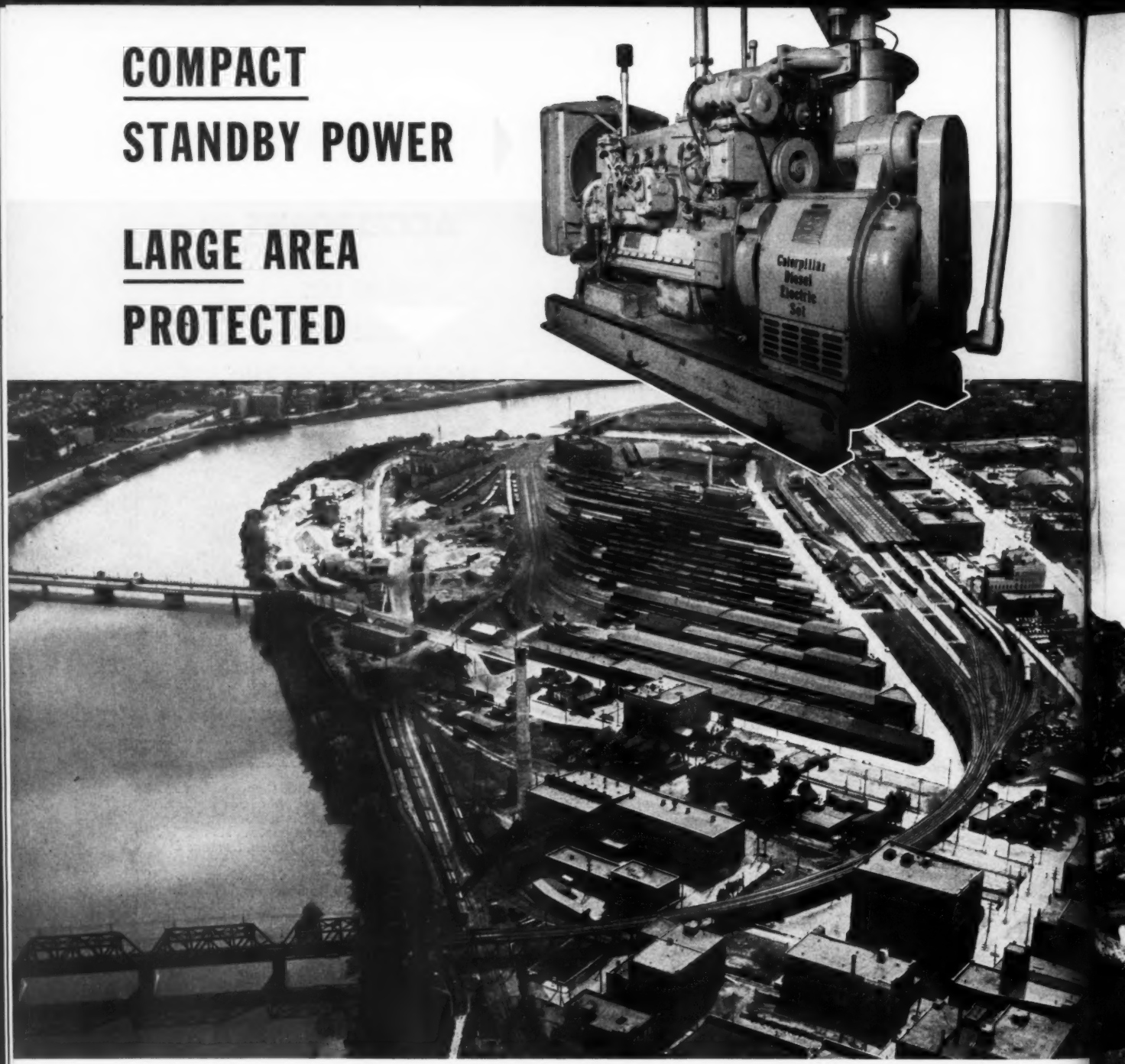

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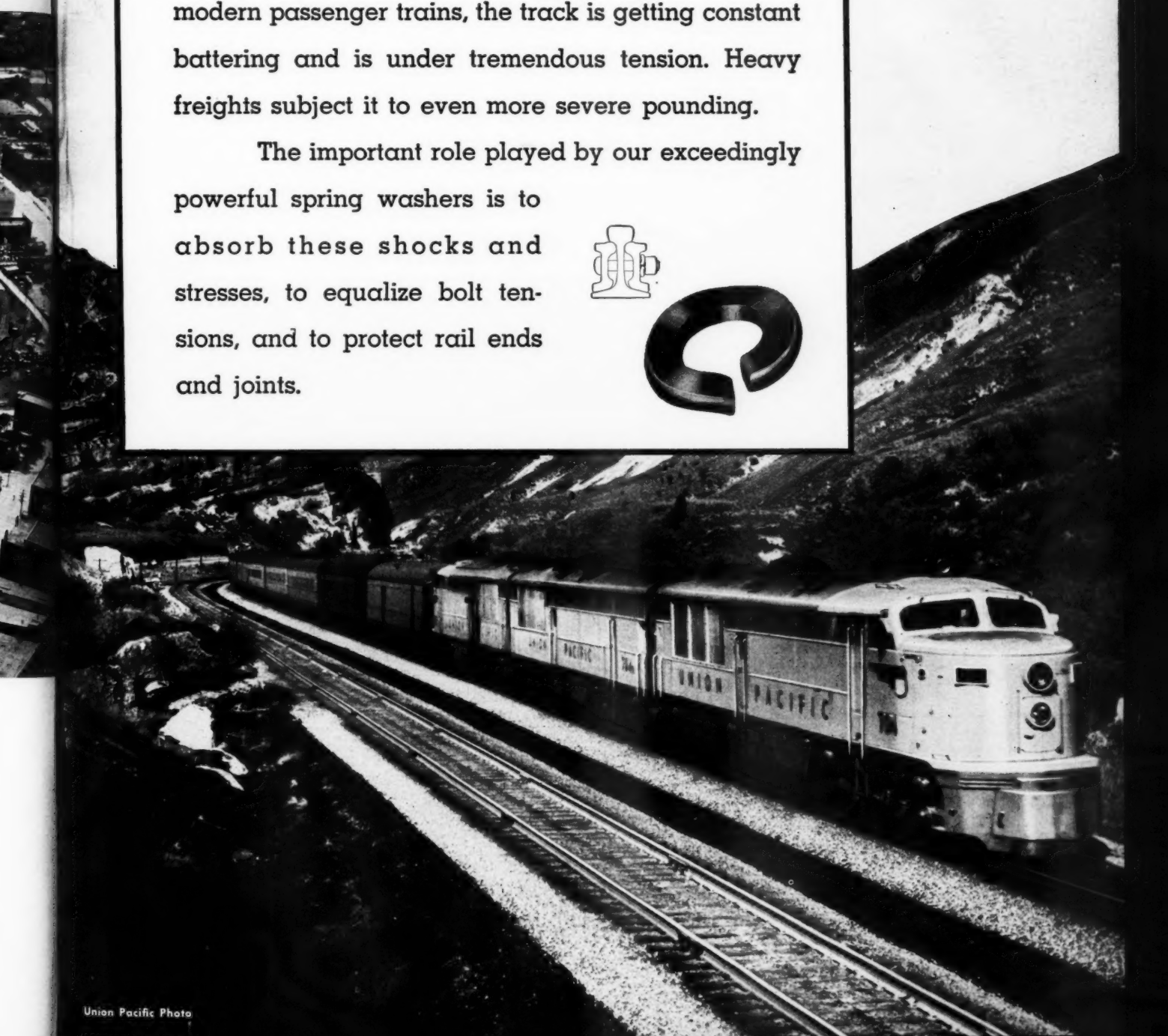
The important role played by our exceedingly powerful spring washers is to absorb these shocks and stresses, to equalize bolt tensions, and to protect rail ends and joints.



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